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THE EFFECTS OF SYSTEMATIC VARIATION OF SPEED AND DIRECTION OF OBJECT FLIGHT AND OF SKILL AND AGE CLASSIFICATIONS UPON VISUO-PERCEPTUAL JUDGMENTS OF MOVING OBJECTS IN THREE-DIMENSIONAL SPACE. FINAL REPORT.

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DESCRIPTORS- *VISUAL PERCEPTION, *PERCEPTUAL MOTOR COORDINATION, *MALES, *SECONDARY SCHOOL STUDENTS, *COLLEGE STUDENTS, PERCEPTION TESTS, PSYCHOMOTOR SKILLS,

THIS STUDY WAS CONDUCTED TO INVESTIGATE THE EFFECTS OF VARIATIONS IN THE SPEED AND DIRECTION OF A FLYING OBJECT ON VISUO-PERCEPTUAL JUDGMENTS MADE, DIFFERENCES IN THE ABILITY OF SKILLED AND UNSKILLED SUBJECTS IN MAKING SUCH JUDGMENTS, AND THE EFFECTS OF AGE OR MATURITY LEVEL ON THE SPEED AND ACCURACY OF SUCH JUDGMENTS. THE SUBJECTS WERE 54 MALE JUNIOR HIGH, HIGH SCHOOL, AND COLLEGE STUDENTS CLASSIFIED AS SKILLED OR UNSKILLED DEPENDING ON EXPERIENCE IN BALL COMPETITIONS, PERFORMANCE ON A VELOCITY TEST, VISUAL ACUITY, AND DEPTH PERCEPTION CAPACITY. THEY WERE ASKED TO JUDGE VISUALLY THE FLIGHT OF A MOVING OBJECT BY CHOOSING AN "OPTIMUM POINT FOR INTERCEPTION" AND QUICKLY MOVING TO THE SELECTED SPOT. FIVE VARIABLES WERE CONSIDERED--(1) SPEED OF PROJECTION, (2) VERTICAL DIRECTION OF PROJECTION, (3) HORIZONTAL DIRECTION OF PROJECTION, (4) SKILL LEVEL, AND (5) AGE OR MATURITY LEVEL. MEASURES INCLUDED A REACTION TIME MEASURE, A MOVEMENT TIME INDEX, AND THREE MEASURES OF SPATIAL ACCURACY OF VISUO-PERCEPTUAL JUDGMENT. RESULTS SHOWED THAT THE SPEED AND ACCURACY WITH WHICH THE FLIGHT OF A MOVING OBJECT WAS JUDGED DEPENDED ON SPEED, THE HORIZONTAL DIRECTION, AND THE VERTICAL DIRECTION IN WHICH THE OBJECT WAS MOVING AT THE TIME OF JUDGMENT. HIGHLY SKILLED SUBJECTS WERE SUPERIOR TO UNSKILLED ONES IN MAKING VISUO-PERCEPTUAL JUDGMENTS. AGE HAD LITTLE OR NO EFFECT. TABLES AND CHARTS ARE INCLUDED. (AUTHOR/NS)

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Toledo, Ohio

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U.S. DEPARTMENT OF
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Summary

The purpose of the present study was threefold: (i) to assess the effects of systematic variation in velocity and direction of ball flight upon visuo-perceptual judgments made about moving objects in space; (ii) to determine whether or not highly-skilled and poorly-skilled performers differ in their ability to visually judge the flight of a moving object in three-dimensional space, and (iii) to assess the effect of age or maturity level of the individual upon the speed and accuracy of such visuo-perceptual judgments.

The experimental situation was as follows: a tennis ball was projected into the air from a Tennis Ball-Boy machine. The ball was interrupted in its flight by a canvas suspended four to five feet above the head of the subject. Subjects thus never came into actual physical contact with the moving object. The task of the subject was to visually judge the flight of this moving object, that is, to decide where the object was going in its flight, to select an 'optimum point for interception', and then to move as quickly as possible to that selected spot.

Five variables were selected for study. These included:

(a) <u>Speed of Object Projection</u>, used to assess the effects of velocity of ball flight upon judgments about moving objects in space;
(b) <u>Vertical Angle of Object Projection</u>, used to assess the effects of the vertical direction of object flight upon visuo-perceptual judgments about moving objects in space;
(c) <u>Horizontal Angle of Object Projection</u>, which served as a basis for evaluating the effects of horizontal direction of object flight upon visual judgments about the flight of moving objects;
(d) <u>Skill Level</u>, and
(e) <u>Age or Maturity Level</u>.

These latter two variables provided the bases for looking at differences in visuo-perceptual performances as a function of skill and/or age classification.

A total of fifty-four (54) subjects participated in the study. Eighteen subjects each were selected from a population of junior high, high school, and college age males. Of the eighteen subjects thus selected, nine were further classified as skilled, nine as unskilled. The criteria for skill classification were: (a) the number of years of participation in organized baseball competition, including varsity and/or Little League membership and (b) the position held by the individual in a distribution of scores based upon performances on an Overarm Throw for Velocity test. Subjects were also screened for minimum visual acuity and depth perception capacity.

Measures of the visuo-perceptual judgment included a reaction time measure, a movement time index, and three measures of the spatial accuracy of the visuo-perceptual judgment. The data were analyzed by means of five separate univariate analyses of variance, each using a single performance index per analysis. Where appropriate, Scheffe's Multiple Comparisons Test was used to compare differences between group means.

Results were as follows:

(1) The speed and accuracy with which the flight of a moving object was judged was, to a large extent, dependent upon the specific set of visual cues involved, that is, upon the particular speed, horizontal and/or vertical direction in which the object was moving at the time it was being judged. This of course suggests that if we are to enhance the degree of success experienced by the individual in learning and/or performing certain gross motor skills, we need to begin to identify more specifically the kinds of visual cues involved in the performance of motor skills and to evaluate them in terms of the kinds of demands which they place upon the sensori-perceptual apparatus of the individual.

(2) Individuals classified as highly-skilled were significantly superior to individuals classified as poorly-skilled in visually judging the flight of a moving object in space. Such findings tend to support the notion that the highly-skilled performer may, in fact, possess a sensori-perceptual mechanism that is superior to that of the unskilled performer. If such differences in the visuo-perceptual capacities of the hihgly-skilled and the poorly-skilled sports performer do exist, it is important that we begin to establish whether or not such differences are innate ones or if the 'potentially' unskilled individual can be trained to use his visuo-perceptual apparatus more effectively through properly planned and appropriately timed perceptual-motor experiences.

(3) Age, as represented by a sample of junior high, high school and college age males, had little or no effect upon the speed and accuracy with which the individual judged the flight of a moving object in three-dimensional space. In a recent study concerned with the development of visual perception in the young child, Williams (109) reported that visuo-perceptual abilities involved in judging the flight of a moving object in space appeared to be functionally mature at about eleven years of age. Since the average age of the youngest group studied in the present investigation was twelve, this may account for the fact that no significant age differences were found.

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CHAPTER I

INTRODUCTION

> All men by nature desire to know. An indication of this is the delight we take in our senses; for even apart from their usefulness they are loved for themselves; and above all others the sense of sight. . . . .the reason is that this, most of all the senses, makes us know and brings to light many differences between things (30, p.13).

That vision and/or visual perception are inexticably linked with the total action system of the organism is seen in the fact that it is through the functioning of the visual mechanism that much of the adaptive behavior of the organism is accomplished. For example, the Drosophila or fruit fly, through its visual faculties, is normally able to detect movement in its external environment. It is not unusual, however, for visuo-perceptual abnormalities to occur in these flies and when this happens, the visually abnormal fly is unable to detect movement in its environment (61). As a result, the fly soon falls victim to the 'unperceived' movements of other organisms. Vision, in this case, plays an important role in the survival of the organism.

The visual mechanism tends to assume an equally important role in the normal functioning of organisms higher up on the evolutionary scale and, in man, becomes an integral part of the whole of his behavior. In fact, it seems that Gesell may not have been far from correct when he suggested that "no one of the major fields of (man's) behavior - motor, adaptive, language, and personal-social - is normally devoid of its visual content or control." (30, p.214)

Theoretically, the importance of visual perception in gross motor performance has not been overlooked. In an article which appeared in the College Physical Education Association Proceedings, Hubbard (54, p.59) wrote:

> Sports skills are not exclusively motor. . . . (they) require special ability in analyzing and interpreting visual cues or refined visual perception.

Consider a sports situation in which the individual is required to manipulate and/or move his body in relation to a moving object in space. Successful adaptation to such a situation might be visualized, schematically, as providing answers to two main questions:

(a) Where is the object going, that is, how fast is it moving and in what direction, and

(b) How must I, the performer, move to successfully interact with this object, that is, to catch it or strike it or kick it?

The first problem is obviously a visuo-perceptual one, the second, a motor problem. A completely adaptive motor response in this situation would then require a precise visuo-perceptual judgment on the part of the performer. In other words, to perform successfully, the individual must make an accurate judgment about the characteristics of the present stimulus situation. In addition, since there is, in most sports situations, little if any time available to 'rejudge' the stimulus, this initial judgment or interpretation must be both rapid and precise if the performance is to be successful.

If the initial task facing the performer in many sports situations is a visuo-perceptual judgment, then the key to understanding some of the important facets of gross motor performance may well lie in the visuo-perceptual events which precede the actual movement or motor behavior of the individual. At present we know little if anything about the nature or role of such visuo-perceptual events in skilled motor performance. Hubbard (54, p. 66) has noted that:

> The nature of the perceptual problems in sports has received little study. . . .Such research is as important as understanding the physical-mechanical problems of sports or developing a sound experimental kinesiology. Such research should help us to understand what we mean by 'athletic skill' and ultimately help us to develop skill more adequately.

It is toward a more thorough understanding of the nature and role of visuo-perceptual processes in skilled gross motor performance that the present investigation was directed.

CHAPTER II

REVIEW OF THE LITERATURE

The review of related literature has been divided into the following sections: (a) Visual Perception, (b) Visual Perception and Motor Performance, (c) Perception of Movement, (d) Perception of Speed of Movement, (e) Perception of Direction of Movement, (f) Motion Prediction, (g) Other Factors Affecting Visuo-Perceptual Performances, (h) Visuo-Perceptual Capacities of the Skilled and Unskilled, and (i) Age and Visuo-Perceptual Capacities.

VISUAL PERCEPTION. Perception may perhaps best be described as a series of sequentially ordered sensory events beginning with an object or event in the periphery and ending with an event in the brain of the individual (34,42,43,45,75,92,102,107,114). Visual perception begins then with the receiving of certain stimulus information from the external environment in the form of light rays falling upon the retina of the eye. These light rays are translated by means of complex chemical processes into a pattern or series of patterns of nerve impulses which are ultimately transmitted via complex nerve pathways to the visual sensory area in the cerebral cortex. Concomitantly with the transmission and arrival of this pattern of nerve activity in the cerebral cortex, the past experience of the individual is believed in some way to be integrated with the present pattern of stimulation. Perception then occurs as a result of a number of complex neural events occuring somewhere in the higher regions of the brain (12).

VISUAL PERCEPTION AND MOTOR BEHAVIOR. The study of perception and the study of overt motor behavior have, more often than not, proceeded independently of one another. Even though some of the early work of psychologists suggested that perception and movement might, in fact, be inextricably interrelated in the production of overt motor behavior, it has not been until recent years that such phenomena have gained the attention of scientists and scholars. Many psychologists, educators, and physical educators now assert that perception and movement are but variations of a single mechanism, a mechanism which, in essence, allows man to direct and/or modify his movement in 'accordance with variations in stimulus patterns' in his external environment (22,54,91, 92).

Recent research concerned with the interrelationship of perception and movement has, indeed, supported the notion that overt motor performance is, in the final analysis, a complex combination of both perceptual and motor events (8,10,18,30,47,70,92,93). That visuo-perceptual and motor information need be coordinated in a precise manner to produce effective motor behavior is clearly seen in the results of numerous studies of distortion of visual feedback (47,92,93). These studies have shown, without exception, that when visual information related to an overt motor act is spatially or temporally distorted, the associated motor performance deteriorates markedly. It appears that only by actively moving the body and/or body parts within the context of this displaced visual environment can effective behavioral adaptation occur. Held (50,51,52), for example, found that behavioral adjustments to rearranged visual fields significantly improved when the individual was permitted to voluntarily initiate movement within this new environment. Hoepner (53) and other (92,115) have reported similar findings. After extensive investigation of this phenomenon, Held concluded that the same mechanism was probably involved in the individual's adaptation to a rearranged visual field as was involved in the original acquisition of spatial behaviors by the child and that, in either case, movement with its concurrent visual feedback was a vital ingredient in the development of spatially coordinated behavior.

Studies involving both lower organisms and humans who were deprived of vision or visual information for varying periods of their lives also support the idea that visuo-perceptual information must, in some way, be coordinated with motor activity in order for normally coordinated spatial behaviors to develop (68,70,87,88,103,110). Reisen (88) has shown, for example, that in chimpanzees reared in the dark, the ability to coordinate movements with spatially perceived objects was completely lacking and built up slowly only after the animal was put into a natural environment. That is, the animal began to behave 'normally' only after he had had opportunity to coordinate visual and motor experiences.

Similarly, Wilson (110) reported that monkeys, neonatally deprived of patterned light, were much like the newborn infant monkey in that many visual and visuo-motor behaviors were lacking in these animals. In other words, there seemed to be a close similarity, behaviorally, between the newborn monkey and the _newly seeing_ monkey. When the visually deprived monkeys were exposed to patterned light, visuo-motor behaviors of various kinds began to appear and in much the same manner as in the young infant monkey. Von Senden (103) has reported a similar lack in the development of spatially-oriented visuo-motor behaviors in congenitally blind humans after vision was restored by surgery. Simple geometric figures which were readily recognized by touch could not, for example, be recognized as easily (as is generally the case with the normally-seeing individual) through vision alone.

In a slightly different approach, Kurke (68) compared the behavior of chicks who received a regular regimen of motor activity during the first ten days of their lives with that of a comparable group of chicks who did not receive such motor experience. Results showed that the depth perception of the chicks who had had motor experience was significantly superior to that of chicks who had not had such experience. This suggests that certain visuo-perceptual capacities may be, to some degree, dependent upon motor experience.

A similar kind of phenomenon has been suggest by Gibson (34, p. 225) as a result of his work with vision and movement. He states that "retinal stimulation is actively linked to bodily action from birth onward. . . ." and that for "every seeing individual there is a co-variation of retinal stimulation and muscular-tactile stimulation" which vary together in a continuous and unique way until they ultimately become associated with a specific set of motor or behavioral reactions. Gibson (34) thus also supports the general belief that an integral part of the development and refinement of overt behavior is the coordinating of visual and motor experiences. Regardless of how it is approached, available evidence leaves little doubt that vision and/or visual perception assume important roles in refined motor behavior.

Physical educators have not infrequently alluded to the presence and perhaps important role of visuo-perceptual events in gross motor performances. Nearly twenty years ago, for example, McCloy (72, p. 34) cited "the judgment of the relationship of the subject to external objects" as an important factor in motor educability. More recently Kretchmar (67, p.241) has written that "it is only through the ability of the body to translate visual cues into muscular language that <u>things</u> become guides to action." Other physical educators (22,54) have suggested that there may, in fact, exist a visuo-perceptual continuum along which various motor performances may be distributed.

Direct evidence of the role of visual perception in the performance of motor skills is seen in the work of Fleischman and Hempel (25) who found that the factors which dominate the early learning and performance of a complex psychomotor skill were, in fact, visuo-perceptual in nature. That is, the dominant factors in early learning were those concerned with visualization or interpretation of various aspects of the visuo-spatial environment. The factors most important in later stages of learning and performance were, on the other hand, predominantly motor in nature.

Other factor analytic studies have also indicated that certain visuo-spatial factors may be important in the performance of various motor skills (1,24). Ayres (1), for example, studying the perceptual-motor behavior of children identified two main factors which were common to the nineteen motor tasks involved in the investigation. One was a general perceptual-motor ability factor dominated by tactile and kinesthetic elements, and the other a visuo-perceptual factor strongly loaded with tasks more purely visual in nature.

Fleischman (26), in a study of skilled psychomotor performance, identified nine factors common to perceptual-motor performances. Four of these nine factors involved visuo-perceptual capacities. These factors included:

(a) a factor called perceptual speed, or the ability to make rapid comparisons of visual forms and to note similarities and differences in form and detail,

(b) a factor called visualization, or the ability to mentally manipulate visual images of objects, and,

(c) two factors called spatial relations I and II, the first involving the ability to interpret spatial characteristics of the stimulus situation and the second the ability to discriminate direction and to orient movement patterns accordingly.

The remaining five factors were ones characterized by tasks which were predominantly motor in nature.

Studies relating to gross motor performances are not as plentiful as those involving fine motor skills. In one study involving the learning of selected gross motor skills, Stallings (95) found that individuals who scored high on certain aspects of a 'visuo-spatial abilities test' displayed significantly superior performances in the early stages of the learning of these gross motor skills than did individuals who scored low on the same test. Sherman (91), has also reported that football players were able, with only brief exposures to the stimulus field, to develop a high degree of accuracy in using external visual cues to direct subsequent passing performance. Graybiel (44) reported that when athletes were deprived of peripheral visual cues, certain highly refined motor performances, including the javelin and discus throws deteriorated to a marked degree. The movements of athletes performing such skills were clumsy and the distances covered by the throws significantly shorter. This suggests that certain peripheral visual cues may be important in the performance of certain gross motor skills.

Hubbard and Senge (55) studied visual movements of batters via motion picture analysis and reported that pursuit movements of the eyes appeared to be the primary basis for tracking the oncoming ball. These authors suggest that batting is thus more a visuo-perceptual problem than a motor or reaction time problem. Although such studies as these are few in number, they do in general suggest that visual perception is an important component of gross motor performance.

<u>PERCEPTION OF MOVEMENT</u>. In the classic investigation on the thresholds of visual movement, Brown (14) reported that the threshold for just

discriminable movement occurred when objects moved at speeds ranging from 0.11 to 0.30 cm/second. This rate of movement is proportional to approximately 2 to 6 minutes of the arc per second. The exact rate of speed required for the perception of movement to occur was, in this case, dependent upon the size of the visual field in which in was viewed. Brown and Conklin (15), in a later study, used rates of movement varying from 1.61 feet/second to 27.37 feet/second and found that although the threshold for movement varied as a curvilinear function of both speed of movement and exposure time, thresholds were generally lower for faster rates of movement.

Results of a study by Gottsdanker (39) indicated that the threshold for the perception of movement could be greatly reduced by placing certain visual cues in the environment in which the movement was observed. Thresholds for the perception of peripheral movement, although affected by the same general phenomena, are usually higher than those of central or foveal vision (42). These studies would suggest then that no exact or unchanging value for the threshold of the perception of movement can be stated for such a threshold is affected by a variety of factors including the size of the visual field, the speed of the movement, and the nature of the background against which movement is observed. It is obvious, however, that only minimal amounts of displacement of an object are necessary for an individual to perceive that movement is occurring.

PERCEPTION OF SPEED OF MOVEMENT. Several studies have looked at the thresholds for perceiving differences in the rate or speed of movement of an object, or difference thresholds (41,80,104). Notterman et al (80) studied the difference limen for velocity and found that Weber's Law, $DL = \frac{\Delta V}{V}$ held true for only a very small portion of the total range of velocities used in the study. The Weber Fraction, an indication of the sensitivity to changes in velocity, was quite small for very slow angular velocities, indicating that only small increments in velocity were required before the individual perceived a change in the rate of movement. At higher speeds the fraction became quite large. Thus, larger increments in velocity were necessary before individuals could perceive a change in the rate of object movement at faster rates of speed. Gottsdanker et al (41) found that for the individual to perceive a change in velocity of an object, presently moving at a constant rate, there had to be at least a 40 to 50% increase in the speed of movement of that object. He concluded that this may represent a general insensitivity on the part of the individual to gradual changes in acceleration. This is, of course, different from the perception of instantaneous changes in speed of movement for which thresholds are very low.

The perception of velocity of a moving object may be affected by any number of factors which may be present in the stimulus situation. Goldstein (36) found that visual judgments of the velocity of a moving stimulus were affected by the amount of time the moving object was viewed. The speed of movement of the stimulus was perceived to be slower when subjects were permitted to view the object for moderately long periods of time. The most accurate judgments of velocity were made, strangely enough, when the viewing time was relatively short. It has also been reported that prior exposures to a moving stimulus pattern may affect the velocity at which stimuli presented subsequently are perceived to be moving. Carlson (17), for example, found that prior exposure to other movement tended to cause the perceived velocity of a moving light to be significantly reduced, that is, the object was perceived to be moving more slowly that it normally would be.

The perception of velocity or speed of movement is also affected by the visual context in which it is observed. Johansson (57) reported that when two objects were moving simultaneously, individuals tended to experience what he called a 'velocity synthesis'. What occurred in this 'velocity synthesis' may be described as follows. A single spot of light moving at the same rate of speed as a second group of two spots was perceived to be moving half as fast as the two spots of light. In other words for all three of the dots to be perceived as moving equally fast, the single spot had to be moving twice as fast as the group of two dots.

Gemelli (28) reported an interesting phenomenon in a study of the visual perception of movement. When subjects in this study were asked to judge the speed of two different categories of objects: (a) those normally associated with movement of some kind (airplanes) and (b) those not generally associated with movement (geometric figures), the airplanes were always perceived or judged as moving faster than the simple geometrical forms. Gemelli (28) suggested that the individual uses his prior knowledge about an object and its movement in making his judgment about the present speed of movement of that object. No studies could be found which dealt with the perception of the velocity of moving objects in three-dimensional space.

PERCEPTION OF DIRECTION OF MOVEMENT. No studies were available which dealt solely with the perception of direction of movement. Most work has been concerned with the interdependency of both speed and direction of movement upon judgments made about a moving object in space. Results of one study which involved judgments about a moving disk did indicate that direction of movement tended to be perceived with greater accuracy than did speed of movement. Gemelli (28) has also reported that if the third dimension is added, perception of direction is 'quick and evident'.

Gemelli (28) noted in his study of the moving disk that the direction of movement of the disk significantly affected the precision with which the speed of movement was assessed. For instance, movement in a downward direction, either perpendicular or slanting, was judged as being more rapid than movement in either an upward or a horizontal direction. In terms of movement in a horizontal direction, at slower speeds, objects moving from left to right were in general judged as moving faster than objects moving from right to left. This directional effect, however, seemed to be erased at higher speeds. Other investigators (37,101) have reported no significant effects due to the horizontal direction of movement upon judgments of the speed of a moving object. Van Waters (101) suggested that the effect of horizontal direction of movement upon judgments of velocity was a matter of individual differences. For example, in his study some individuals were more accurate when asked to judge a light moving from right to left while others were more accurate in their judgments when the light moved from left to right.

Another study (13) dealing with the angle of approach of the stimulus object, reported that the closer the angle of approach of the object to the line of sight of the observer, the greater the extent of movement required by the individual to make a correct judgment concerning the movement occurring. When there was zero degrees lateral displacement, the observer was unable to make an accurate judgment of the movement at all.

MOTION PREDICTION. A number of studies have been concerned with the effect of target velocity upon a phenomenon referred to as motion prediction (29, 38,40,108). Motion prediction is defined by Weiner (108, p.) as "an extrapolation to a future position (of an object) from current information." In other words, in these situations, the individual is asked to make certain judgments or predictions about the future position of an object based on a brief or momentary exposure to the moving object. Gibson (33) used the 'Estimation of Velocity Test' to study motion prediction. In this study, the subjects observed a motion picture of an aircraft flying into a cloud followed by a shell burst on the screen. Subjects were asked to report whether the shell had burst behind or ahead of the aircraft which was no longer visible. Results revealed that most subjects were quite accurate in their judgments and could detect a deviation of as little as one inch. Gerhard (29), in reviewing this study, has suggested however that due to the limited number of alternative responses available to the subject, this may be somewhat misleading as an indication of the everyday ability to judge velocity.

In general, available evidence suggests that the accuracy of predictions about a moving target may be directly related to the speed of movement of that target (29,40,108). Gerhard (29) reported that faster speeds were more difficult to judge in predicting movement than were slower speeds.. The task of the subject in this study was to adjust the speed of a 'horizontally' moving light to match that of a light moving vertically downward so that both lights reached a specified point in space at the same time. The display panel for these two lights was partitioned into six sections and was so arranged that the path of the vertical light could be obscured for as much as one-half of the length of its path. Results indicated that under these conditions faster speeds were more difficult to judge than were slower speeds. Gottsdanker (38), in another study of motion prediction, found that although the prediction of the path of a moving object tended to be more accurate at fast speeds, it was not significantly better than at slower speeds.

Two studies reported, however, (40,108) that as the speed of movement increased, the accuracy of motion prediction also increased. That is, the individual was able to predict the end point of an object's movement more precisely if the object were moving at faster rates of speed. Gemelli (28) has suggested that there are some individuals who simply cannot estimate velocity accurately and that these individuals will regardless of the situation, tend to make large errors when judging the speed of movement of an object.

In an attempt to determine what other factors might affect motion prediction, Gerhard (29) blocked out various portions of the visual field, ranging from 20% to 80%, in which moving objects were viewed. Results indicated that blocking out as much as 80% of the visual field had little or no effect upon the accuracy of the motion prediction performance. In fact, initial quick judgments were with regard to estimating the speed of movement of an object, the most accurate. It is interesting to note that in the study by Gerhard (29), a fairly orderly sequence of events seemed to occur in these motion prediction performances. First, the subject judged the speed of the vertical light and adjusted the speed of the horizontal light accordingly. He then made no further adjustments until the vertical light reappeared at which time only small final adjustments were made in the speed of the horizontal light. This suggests that the individual may make an initial gross judgment of the speed of the moving object and then, if necessary, make smaller or finer adjustments at a point later in time. This would not seem to be too far afield from the kind of thing which might logically occur in a three-dimensional sports situation.

OTHER FACTORS AFFECTING VISUO-PERCEPTUAL PERFORMANCE. Evidence indicates that if the series of events leading to 'perception' is interrupted at any stage between its point of origin in the periphery and its end point in the cerebral cortex, perception as we normally think of it does not occur (10, 12, 79). It has been shown experimentally that a number of factors may affect the intricate processes underlying visual perception. In fact, interpretation or perception of a particular stimulus situation may vary markedly according to the number, nature and arrangement of the elements or events making-up the total stimulus complex(2,3,21,27,35,59,60,69,71,82,97,106).

Evidence suggests, for example, that the background or context in which stimulus objects or events are viewed may affect visuo-perceptual judgments of a given stimulus situation. French (27) studied the effect of a background of visual noise on the recognition of certain visual target patterns and found that increasing the amount of target noise (confused visual background) produced a steady decrement in the ability of the individual to visually identify various target patterns. Thresholds for perceiving curvature in a line have also been reported to change as a result of the visual context in which they are viewed (97). In a slightly different vein, Gogel (35) investigated the perception of the relative distance of objects in the visual field and indicated that such perceptual judgments may be readily influenced by the presence of other distorted objects in the visual field of the observer. This of course suggests that subtle changes in the background or content of the visual field may bring about considerable variation in visuo-perceptual judgments.

Several studies have reported that changing the spatial relationships between the stimulus object or event and the observer affected the individual's ability to interpret or perceive a given stimulus situation (21,59,85,106). Rochlin (85) reported that individuals were less accurate in their perception of parallelness when judging tilted or obliquely-placed lines than when viewing either horizontal or vertical ones. Weine and Held (106) also reported definite changes in the perceived size of various angles as a function of the position of the angle in the visual field. Errors in estimated size were greatest for those stimuli located in the upper right and left quadrants of the visual field. Other investigators (59,82) have found that individuals tend to be more sensitive to stimuli in certain parts of the visual field than in others. Overton and Wiener (82) found, for instance, that the threshold for word recognition was significantly lower in the right visual field than in the left.

In a study by Kabrick (59), subjects responded with a simple movement to visual stimuli located at a variety of points in the visual field. Individual reaction time to visual stimuli positioned more than 30^0 above the horizontal and/or more than 55^0 from the center of the visual field was significantly slower than to stimuli located at other points in the visual field. Similarly, Banzejova (3) found that reaction times to stimuli placed at increasingly greater angular displacements from the point of visual fixation increased steadily and became significantly longer at positions of $50\text{-}70^0$ lateral displacement. Smith's work (92) has also indicated that various angular displacements of the visual field may affect the same motor performance in completely different ways.

Changes in the position of the observers may also affect the accuracy of the perceptual judgment (23,71). In a study by Matin (71), subjects viewed a dark room with monocular vision and were asked to report the location of a light flash relative to a fixation target which was seen three seconds before. Results indicated that if the subject faced the fixation target squarely, the threshold for the perception of displacement of the light flash was lower than if he were positioned to the right or the left of the fixation target. Damron (23) had subjects view slides from positions at various angular displacements along the horizontal plane. These angular displacements were directly related to positions which members of a football team might occupy on the playing field. Slides viewed from the most extreme angles (right or left ends) were the most difficult to recognize or perceive while those viewed from positions just off-center (right or left guard positions) were most easily perceived. Evidence such as this suggests of course that very subtle changes in the nature, background, or position of the stimulus or observer may affect the precision of a given visuo-perceptual judgment.

VISUO-PERCEPTUAL CAPACITIES OF THE SKILLED AND UNSKILLED.

Depth Perception. Available research involving differences in visuo-perceptual capacities of performers of different skill levels is scanty and contradictory. Graybiel (44), reporting on Russian studies of vision and sports performance, has presented some evidence to support the notion that there may be a relationship between proficiency in certain sports skills and depth perception faculties. One such study indicated that, as a group, highly-skilled tennis players perceived depth more accurately than did players less highly skilled in the game of tennis. Other investigators (4, 81) have reported similar findings. Olsen (81), for example, used the Howard-Dolman apparatus to measure depth perception of athletes and non-athletes and found that athletes were significantly superior to non-athletes in their depth perception performances. Bannister and Blackburn (4) compared the inter-pupillary distances (purported to be an indirect measure of depth perception) of males classified as 'good' in games with those classified as 'poor' in games and reported that athletes tended to have significantly greater inter-pupillary distances and thus significantly better depth perception than the 'poor' or unskilled person.

Other studies have, on the other hand, found little or no evidence of differences in depth perception capacities between performers of different levels of ability. Clark and Warren (20), in an extensive investigation, reported the following results: (a) no significant relationship between inter-pupillary distance and depth perception performance; (b) no significant differences between athletes and non-athletes in inter-pupillary distance; and (c) no significant differences between athletes and non-athletes in depth perception as measured by performances on the Howard-Dolman apparatus. These investigators suggest that depth perception performances as measured by these particular techniques may be of a completely different nature than that which is involved in skilled performances in three-dimensional sports situations, and thus one should not expect to find differences between the athlete and the non-athlete.

Peripheral Vision and Visual Acuity. When aspects of vision and visual perception other than depth perception have been looked at as a basis for distinguishing among different levels of ability, results have again been conflicting. Olsen (81), studying the visual span of athletes and non-athletes, found that athletes were superior to non-athletes in span of apprehension. That is, athletes could take in or recognize a significantly larger number of elements in a single glance than could the non-athlete. Stroup (96), too, presented evidence of a significant difference between basketball players and nonbasketball players in terms of the extent of their peripheral fields of motion perception. Barclay (5), however, reported that success in basketball shooting was not, in any way, related to measures of peripheral vision.

In terms of visual acuity or sharpness of vision, both Barclay (5) and Tussing (98) reported no relationship between visual acuity and success in sports situations.

Other Visuo-Perceptual Categories. Results of a study of some 162 men and women of varying degrees of athletic prowess, ranging from the champion athlete to the low-skilled individual, indicated that certain visuo-perceptual capacities seemed to account, in large part, for differences in performances of skilled and unskilled individuals (74). These visuo-perceptual capacities included depth perception, static balance performances (thought to involve a visual factor of some nature), and performances on the McCloy's Blocks Test (a task which is believed to measure the individual's ability to make quick, adaptive judgments about visual stimuli). Pierson (83) found, however, no significant differences in the performances of fencers and non-fencers on the same Blocks test.

In a study involving the relationship between figure-ground perception and the accuracy of bodily adjustments made by the individual to an on-coming tennis ball, Kreiger (66) found that these two abilities were more highly correlated in individuals of intermediate tennis skill than in players of beginning skill levels.

Graybiel (44) has reported, again from the Russian studies on vision and sport, that certain basic differences may, in fact, exist in the delicacy and sensitivity of the 'eye-movement' apparatus which individuals classified as athletic or non-athletic may possess. It would appear that the athlete may have an 'eye-movement' apparatus which is superior to that of the non-athlete.

In summary, then, there appears to be some evidence to suggest that different visuo-perceptual abilities may at different times assume roles of varying importance in the performance of gross motor skills. Past investigations have not as yet been able to pinpoint the nature of the differences in visuo-perceptual capacities, if any, which may exist between the skilled and the unskilled individual.

AGE AND VISUO-PERCEPTUAL CAPACITIES.

Depth Perception. Considerable capacity for depth perception may appear early in infancy. The famous 'visual cliff' study by Walk and Gibson (32), for example, indicated that even before six months of age, the child was able to perceive depth in the form of a drop-off. Bower (11) found that even younger infants responded accurately to differences in distances of cubes placed before them. That is, at six weeks, the infant was able to make some gross differentiation between objects that were nearer and those that were farther away from him. Gesell (30) reported that binocular convergence (the ability to focus both eyes accurately on an object and thus a forerunner of true depth perception) appeared, on the average, at the end of the second month. These findings suggest, then, that some primitive type of depth perception, geared to perceiving features of the environment which are ultimately essential for adaptation to the three-dimensional space world of the adult, are functional in the infant even as early as 1½ to 2 months.

Studies concerned with depth perception capacities in childhood (113) have shown that in a situation where natural environmental cues are present, the child, two years and above, can discriminate depth as accurately as can the adult. If such cues are removed, however, the child's performance deteriorates. In such a situation, the adult has little difficulty in continuing to perceive depth as accurately as before. Gesell (30) has noted that although a five year old may see no difference between a flat and a stereoscopic slide, a six or seven year old rarely if ever fails to see depth in the stereoscopic slide. It would appear that although the ability to perceive depth appears early, finely differentiated judgments of depth are not well-developed until the sixth or seventh year.

Spatial Directions. Evidence indicates that children master the various sectors of space in a fairly orderly sequence (30,62). Verticals are mastered first, followed by horizontals, and last by the apparently more complex obliques or diagonals. By seven or eight, the child has no difficulty distinguishing between the vertical and the horizontal, the upright versus the inverted, and most children at this age can learn rather easily to tell the difference between a horizontal and an oblique line. Discriminations involving vertical and oblique lines, however, are a little more difficult as are discriminations involving two oblique lines (56). Katsui (62) has noted that eight year olds, although having mastered most aspects of space, still have difficulty with right-left or mirror images. Not until about the age of nine or so then does the child gain complete mastery over the various facets of spatial direction. Studies concerned with the perception of the direction of moving objects as a function of age could not be found.

Perception of Movement. Not a great deal is known about the perception of movement in general and even less seems to be known about its development in children. Gesell (30) has reported that almost from the moment of birth, the child appears to show an awareness and fascination for movement in his environment. Haith (46) too has found that an infant, three to five days old, will respond positively to the intermittent movement of a visual stimulus.

This suggests that movement of objects in the environment may be one of the 'salient' features of the infant's space world and thus the perceptual mechanism of the young infant is geared to perceive movement from the very beginning of life.

According to Gesell (30), the child at five can follow a target moving at increased rates of speed and through fairly complex paths. Eight and nine year olds had progressed considerably in their judgments of the speed and direction of a moving target and rarely, if ever, overshot or lagged behind the target in their visual pursuit movements. Children of this age, however, seemed to be greatly influenced in their judgments of range or speed of movement by the total situation in which the movement occurred. For example, if two objects, started at the same point in space were moved, one along a straight path and the other along a very crooked path, the child when asked to make one 'go as far as' the other, stopped the former opposite to the latter regardless of the different length of the two paths(59). In terms of relative speed, one object was judged to move faster than another only when it was observed to go past the former. Thus perceptual judgments involving certain time-space-force concepts appear to be relatively undeveloped in the eight and nine year old.

In an isolated study of the effects of speed and direction of ball flight upon the catching performance of elementary school children, Bruce (16) reported that ball velocity significantly affected the catching performances of second and fourth grades but had no effect upon the catching performances of sixth graders. Younger children appeared to perform better when the ball was moving at a slower speed. The direction of ball flight had no effect upon the child's catching performance at any of the ages studied.

A recent study by Williams (109) indicated that the child may begin to develop a more refined capacity for making complex perceptual judgments about moving objects in space sometime during the upper elementary school years. For example, this study found that fourth, fifth, and sixth graders were significantly more accurate in judging the flight of a tennis ball than were first, second, and third graders. Williams reported that although children at six, seven or eight years of age responded quickly to the tennis ball, their judgments about the flight of that moving object were grossly inaccurate. Not until eleven years of age could the child make both rapid and accurate judgments relative to the flight of the moving object in space.

Other Perceptual Capacities. Gibson (31) reported a significant difference between the performances of second, fourth and sixth graders and those of adults in being able to pick out a specific form (a letter) from a context of other extraneous perceptual items. Younger children in this study required a significantly longer time to pick out the correct letter than did older children. Adults were always more efficient at performing this perceptual task than were children of any age. In a slightly different but related experiment, five and six year olds were asked to judge the 'lightness' of target objects when more than one object was presented at a time (6). These children showed great difficulty in making this perceptual judgment accurately. When targets were presented singly, however, the children performed at the same level as adults. Such studies as these point then to the presence of subtle but perhaps significant differences in the visuo-perceptual capacities of the child and the adult.

Overall, evidence would suggest that the child, by the end of the sixth or seventh year, is in terms of certain visuo-perceptual capacities (including depth perception and mastery of spatial direction) nearly mature.

Other visuo-perceptual capacities involving, for example, judgments about the flight of moving objects in three-dimensional space or the perception of relative speed of movement, continue to undergo refinement with age and may not become mature until after the age of eleven years. Age differences in visuo-perceptual capacities of the adolescent seems to have been little studied and no research relevant to the role of visuo-perceptual capacities in sports situations as a function of age could be found.

<u>SUMMARY</u>. Available evidence indicates that visual perception plays an important role in overt motor behavior. Studies which have investigated the nature of visuo-perceptual judgments in general have shown that such judgments are readily affected by a variety of factors, the most important of which seem to be the number or <u>nature</u> of the elements making up the stimulus complex and/or the spatial relationship between the stimulus and the observer. Studies involving the perception of velocity and/or direction of movement suggest that both of these elements may be important in the ultimate accuracy of judgments made about the movement of objects in space. However, most of the research reported by psychologists has dealt with the perception of movement of rods, lights, and/or disks in two-dimensional space. Few, if any, studies have looked at visuo-perceptual judgments of moving objects in three-dimensional space and no research has, to date, been directed toward the problem of defining the stimulus parameters which might affect the accuracy of the visuo-perceptual judgments involved in dynamic sports situations. The need for work directed toward the investigation and clarification of such phenomena is evident.

Although there is some evidence available to suggest that differences in visuo-perceptual abilities may exist between performers of different skill levels, such evidence is at present inconclusive. Studies which have been conducted along these lines have, in general, involved the use of 'static' measures of isolated aspects of the visuo-perceptual processes. For example, performances on tests of static depth perception have, more often than not, been compared to performances requiring rapid responses to moving objects in space. The vastly divergent nature of the abilities involved in these two types of situations has no doubt contributed to the tenuous and conflicting results reported. Research directly concerned with differences between the skilled and the unskilled in terms of the speed and accuracy of visuo-perceptual performances involving moving objects in space is notably lacking in the literature.

Age seems also to be an important factor affecting the individual's visuo-perceptual performance. Still, little or no study has been given to the question of whether or not such age differences continue to be important after early or middle childhood. Research concerned with the effects of age on the kind of visuo-perceptual judgments involved in three-dimensional sports situations is generally non-existent.

In summary, then, there seems to be little theoretical doubt that the visuo-perceptual mechanisms at work in dynamic sports situations are indeed complex and that the 'static' measures of the visual and/or visuo-perceptual processes which have heretofore been used by researchers in investigating such phenomena can neither adequately nor accurately describe the nature or importance of the functioning of such mechanisms. The need for further clarification of the nature of visuo-perceptual responses in gross motor performance and the development of measures and instrumentation which are sensitive to evaluating such problems is self-evident.

CHAPTER III

STATEMENT OF THE PROBLEM

The purpose of the present study was threefold: (i) to assess the effects of systematic variation in velocity and direction of ball flight upon visuo-perceptual judgments made about moving objects in space; (ii) to establish whether or not highly-skilled and poorly-skilled performers differ in their ability to make accurate visuo-perceptual judgments about the flight of moving objects in a three-dimensional sports situation, and (iii) to assess the effect of age or maturity level of the individual upon the speed and accuracy of such visuo-perceptual judgments.

Problem I. <u>Effects of systematic variation in velocity and direction of ball flight upon the speed and precision of visuo-perceptual judgments about moving objects in three-dimensional space</u>.

Successful performance in many sports situations, it has been suggested, requires that the performer interact in precise ways with fast-moving objects in space. Successful adaptation to such a situation would seem to require that the performer make a judgment about certain stimulus characteristics of the moving object in space. Evidence indicates that, as a result of certain subtle changes in stimulus conditions, judgments about a given stimulus situation may vary markedly. This suggests then that the speed and accuracy with which visuo-perceptual judgments are made about moving objects in three-dimensional sports situations may vary as a function of differences in the speed and direction of the flight of the moving object. The following questions therefore should be important ones for physical educators to answer:

(a) What effect does the speed of the moving object have upon the visuo-perceptual judgments made by the sports performer,

(b) What effect does the horizontal and/or vertical direction of object flight have upon judgments made by the individual about the flight of the moving object, and

(c) Is there an interaction involving both speed and direction of object flight which makes for ease or difficulty in judging the flight of a moving object in three-dimensional space?

Problem II. Effects of level of skill upon the speed and accuracy of visuo-perceptual judgments made in three-dimensional sports situations.

Observation of the overt performance of a poorly-skilled individual reveals that he is deficient in his motor output, that is, that the movements he makes are frequently awkward as well as inefficient. We do not know from this simple observation, however, if the movement patterns of these individuals are a result of purely motor faculties such as lack of strength, speed of movement, etc., or if such performance inadequacies are in part due to an initially faulty interpretation of the visuo-perceptual cues involved in the motor performance. If, in fact, the initial task facing the performer in many sports situations is a visuo-perceptual judgment, then one might hypothesize that the poorly-skilled performer is poorly-skilled in part because he cannot 'interpret' differences in stimulus situations rapidly and accurately enough to order the proper adaptive movement. Conversely, this suggests that the skilled performer may be able to make both rapid and accurate judgments about a wide variety of stimulus conditions and thus perform more effectively in situations demanding refined visuo-perceptual judgments. The question of whether or not such differences in visuo-perceptual capacities do, in fact, exist between the skilled and the unskilled performer would seem to be an important one to answer.

Problem III. Effects of age or maturity level upon visuo-perceptual judgments about the speed and direction of moving objects in three-dimensional space.

Research suggests that visuo-perceptual abilities may be important in the performance of certain gross motor skills and that the ability to make certain refined visuo-perceptual judgments is partly a function of the age or maturity level of the individual. If this is true, then it should be of value to outline what age-maturity differences, if any, exist in the individual's ability to visually judge the flight of a moving object in three-dimensional space.

CHAPTER IV

PROCEDURES

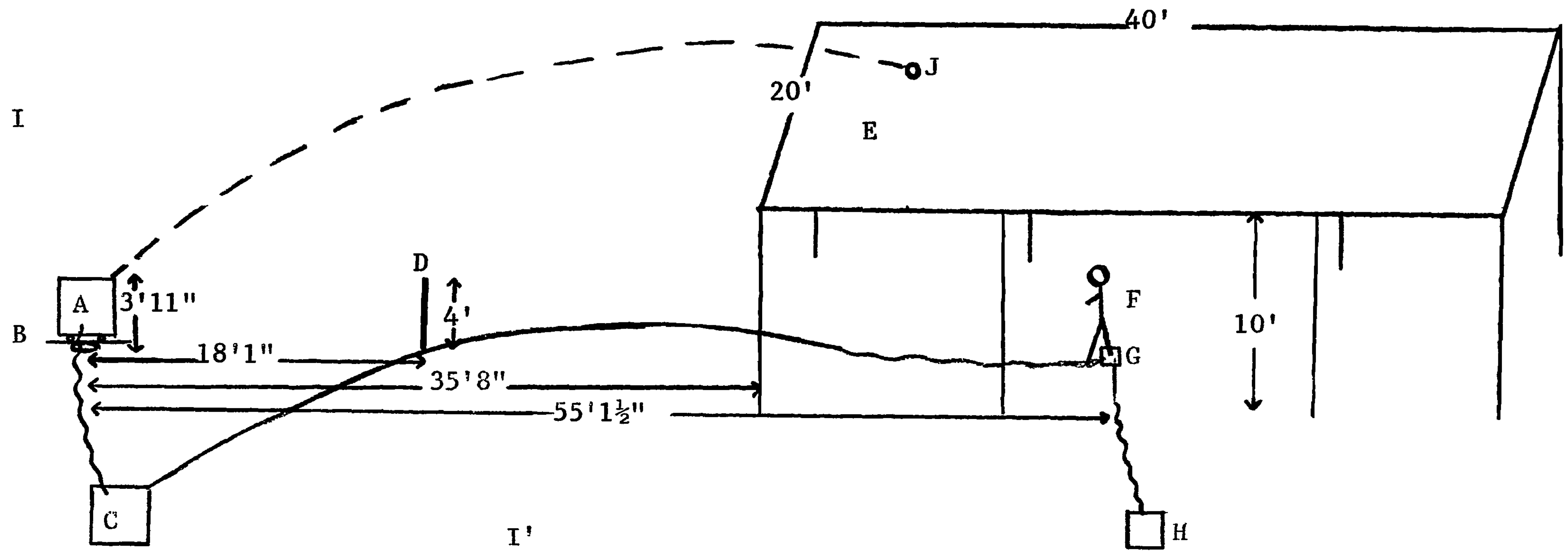
Procedures relevant to the organization and collection of data are presented in this section. The major categories to be discussed are: (1) the task, (2) the general experimental schema, (3) the variables, (4) measures of the visuo-perceptual performance, (5) selection of the subjects, (6) collection of the data and (7) analysis of the data.

THE TASK. The problem under study was centered around the following experimental situation. A tennis ball was projected into the air from a Tennis Ball-Boy machine. This ball was interrupted in its flight by a canvas suspended four to five feet above the head of the subject who stood waiting at a prescribed point beneath the canvas. (See Figure 1, p. 30.) Subjects thus never actually came into physical contact with the ball and saw only the first portion of its flight.

The subject's task was, by using the visual cues received from the observable portion of the object's trajectory, to decide where the ball was going in its flight and to move to that spot on the floor where he judged he should be in order to catch the ball at chest height. In other words, the subject was asked to visually judge the path of the moving object, to decide upon an 'optimum' point for interception, and then to move as quickly as possible to that spot. The emphasis was not on how efficiently he moved to this 'selected' spot but rather upon how *rapidly* he could decide where to go and upon the ultimate *accuracy* of this judgment. (Specific instructions given to each subject may be found in Appendix A, p. 131 .)

FIGURE 1. GENERAL EXPERIMENTAL SET-UP

A = Ball Boy Machine
B = Rotatory Platform
C = Hale Reaction Timer
D = Visual Barrier
E = Canvas
F = Subject
G = Foot Pad
H = Dekan Timer
I,I' = Visual Background
J = Tennis Ball



THE GENERAL EXPERIMENTAL SCHEMA. The general experimental schema was as follows. See Figure 1, p. 30. (More detailed descriptions of the apparatus may be found in Appendix A, pp. 133-135.)

A = Tennis Ball-Boy Machine. A Tennis Ball-Boy, located in the west end of the Women's Gymnasium, was used to project tennis balls into the air under twelve (12) different combinations of speed and vertical and horizontal angles of projection.

B = Rotatory Platform. The Tennis Ball-Boy Machine was secured to the top of a rotating platform which consisted of a 2' x 3' heavy wooden strip attached to a metal pivotal base approximately six inches high. This rotatory platform was used to regulate the horizontal angles of object projection and thus the horizontal direction of object flight.

C = Hale Reaction Timer. A Hale Reaction Timer, located just to the right of the Tennis Ball-Boy machine, was used to initiate the action of the Ball-Boy machine and to measure the reaction time of the subject. That is, the clock on the Hale Reaction Timer was set-up to record the time required by the subject to judge the flight of the oncoming tennis ball.

D = Visual Barrier. A visual barrier, four feet high and ten feet wide, was erected directly in line with and at an eighteen foot distance from the Ball-Boy machine. The purpose of the visual barrier was to eliminate, as much as possible, any visual cues relative to the flight of the tennis ball that the subject might receive from sources other than the actual ball flight itself. For example, the Ball-Boy machine had to be rotated to the right and to the left to obtain the desired variation in horizontal direction of object flight. The movement of the machine itself could have served as an extraneous cue for judging the right-left direction of the ball's trajectory. The use of the visual barrier eliminated the possibility of using such cues. No sound cues were available to the subjects.

F = Subject's Starting Position. All subjects started from a common starting point underneath the canvas (E), approximately fifty-five feet (55') from the source of object projection. The subjects stood on a large footpad, facing the Ball-Boy, and awaited the projection of the ball in a relaxed, ready position.

G = Double Footpad. A double footpad was secured to the gymnasium floor by masking tape. This footpad consisted of two individual footpads placed one on top of the other and taped together with adhesive tape. Footpad 1 was connected to the Dekan Timer and activated the clock used to record the movement time of the subject. Footpad 2 was wired to the reaction time clock on the Hale Reaction Timer.

H = Dekan Timer. A Dekan Timer was used to record the movement time of the subject, that is, the amount of time needed by the subject to get to his 'judged' point of interception. This timer was located to the left and approximately twenty feet (20') away from the subject's starting point under the canvas. This location permitted the tester to clearly observe the movement of the subject in any direction.

I = Visual Background and Lighting. A dark blue curtain was hung behind the Ball-Boy machine so that it stretched across the main portions of the subject's visual field. This provided a homogeneous background against which to view the moving objects in space. Large unbleached muslin curtains were used to cover the side windows in the gymnasium (I') to further insure the consistency of viewing conditions. Only the area in front and to the sides of the canvassed area was directly lighted by overhead lamps located on the ceiling of the gymnasium. The remainder of the gymnasium was lighted indirectly by natural sunlight.

J = Tennis Balls. Balls used in the study were forty-eight (48) unused, white MacGregor Tournament tennis balls.

THE VARIABLES. Five variables were selected for study in this investigation. They included:

1. Age or Maturity Level. Subjects were selected from three grade levels: junior high, high school, and college age populations. These groupings provided the basis for looking at differences in visuo-perceptual performances as a function of age or grade level.

2. Skill level. Subjects were further classified into skilled and non-skilled groupings based upon baseball experience, in order to assess the effects of level of skill upon visual judgments concerning the flight of moving objects in three-dimensional space.

3. Speed of Object Projection. Two levels of speed of object projection were selected for study. See Table 1 below. This variation in speed permitted an assessment of the effects of velocity of ball flight upon judgments of the moving objects in space.

TABLE 1. DESCRIPTION OF THE EXPERIMENTAL VARIABLES

	DESCRIPTION OF VARIABLE		
LEVEL	SPEED	HORIZONTAL ANGLE	VERTICAL ANGLE
1	Fast-48.0'/sec.	Right-5^{0}	High-44^{0}10'
2	Slow-39.7'/sec.	Center-0^{0}	Low-34^{0}22'
3		Left-5^{0}	

4. <u>Vertical Angle of Object Projection</u>. Objects were projected at each of two vertical angles. The two levels of vertical angle of projection were used to assess the effects of the vertical direction of object flight upon visual judgments concerning the flight of the moving object.

5. <u>Horizontal Angle of Object Projection</u>. Objects were projected at each of three horizontal angles: (a) directly at the subject; (b) to the right of the subject; and (c) to the left of the subject. These variations in horizontal angle of projection served as the basis for determining differences in visuo-perceptual judgments as a function of the horizontal direction of object flight.

<u>Selection of the Levels of Speed, Vertical and Horizontal Angles of Object Projection</u>.

<u>Speed</u>. The primary considerations in the selection of the two levels of speed were (1) the variation in force with which the machine was designed to project the ball and (2) the desirability of allowing the subjects sufficient time, when starting from a common point of origin, to actually intercept the ball had it not been interrupted in its flight by the canvas suspended over the subject's head.

The Tennis Ball-Boy Machine used in this study was designed to project balls at each of three different speeds. (These speeds were regulated by a lever located at the lower-right front of the machine.) Forty (40) balls were projected at each of these speeds (in combination with four different vertical angles) in order to determine whether or not balls projected at these three speeds could be successfully intercepted at chest height by the average individual. Subjective evaluations of the catching performances of two freshman women enrolled in the General Required College Physical Education Program at the University of Toledo indicated that, with both subjects starting at the same point in the center of the floor, balls projected at any of the three speeds could, in fact, be reached in time by these subjects to be intercepted at chest height. Since the maximum and minimum speeds at which the Tennis Ball-Boy could project a tennis ball provided for the greatest differences in object flights in terms of the horizontal distances covered by the trajectories, these two speeds were selected as the two levels of the speed variable.

Vertical Angle of Projection. Four criteria were used in the selection of the vertical angles of object projection:

(a) the maximum vertical angle of projection had to be such that the object (projected at maximum speed) would not be interrupted at any point in its flight by the beams on the ceiling of the gymnasium,

(b) the minimum vertical angle of projection had to be great enough to insure that the ball, when projected at either of the two speeds, could be easily intercepted by a canvas suspended over the head of the subject;

(c) the difference between the two angles had to be large enough to allow for immediately recognizable differences in the vertical direction of object flights, and

(d) balls projected at either of the vertical angles selected had to allow the subject sufficient time to reach the desired point of interception.

Working within the limits of these criteria, four settings of the vertical angle of projection were selected for further experimentation. These will be referred to as Vertical Angle I, Vertical Angle II, Vertical Angle III, and Vertical Angle IV. Forty (40) balls were then projected at each of these four angles in combination with the two speeds previously selected. Subjective observations of these projections indicated that only balls projected at Vertical Angle I came into contact with structures on the ceiling of the gymnasium. Since it was desired to have the two angles as divergent as possible, Vertical Angles II and IV were selected for additional pilot work.

Again forty (40) balls were projected at each of these two angles (in combination with the two levels of speed). Subjective evaluation of the catching performances of two college freshman women indicated that balls projected at either of the two vertical angles could be reached in time by these subjects to be successfully intercepted. These two angles were then adopted as the two levels of the vertical angle of object projection.

Subsequent to the selection of the two speeds and vertical angles of projection, fifty (50) additional balls were shot at each of the four combinations of these variables in order to determine the units of each of these variables. (See Estimation of the Values of the Levels of Speed and Vertical Angles of Object Projection, p. 38.)

Horizontal Angle of Projection. To aid in the selection of the horizontal angles of projection, a large protractor was constructed and placed under the center of the pivotal platform upon which the machine rested. (See Appendix A, p.135.) The machine itself could be rotated so that the horizontal angle of projection ranged from 0^0 to 45^0 right or left. The specific angle of projection was clearly indicated on the protractor by an arrow which was drawn on the front of the pivotal platform and which extended out over the surface of the protractor.

Several horizontal angles of projection were selected for investigation on the basis of the distance (right-left) involved in the subject's movement from his original starting point to the optimum point of interception. The angles selected for study are shown in Table 2 shown below. Ten balls were

TABLE 2. HORIZONTAL ANGLES OF PROJECTION: DISTANCE IN FEET RIGHT OR LEFT OF SUBJECT'S STARTING POINT TO OPTIMUM POINT OF INTERCEPTION

	HORIZONTAL ANGLE OF PROJECTION					
CONDITION	1^0	3^0	5^0	7^0	9^0	11^0
Slow-High	.84'	2.50'	4.94'	5.85'	7.50'	9.16'
Slow-Low	.87'	2.60'	5.15'	6.09'	7.80'	9.54'
Fast-High	1.13'	3.46'	6.73'	7.92'	10.16'	12.40'
Fast-Low	1.17'	3.56'	6.94'	8.16'	10.48'	12.78'

projected at 3^0, 5^0, 7^0, and 9^0 and the catching performances of two college female subjects used in previous pilot investigations observed. (Horizontal angles of projection greater than ten degrees or less than three were not used in pilot investigations because the distance involved in the first case was too great, in the second too small, to be of practical value in the present study.) Each series of ten balls was projected in a predetermined random right-left order.

The results of this preliminary investigation indicated that only under the five degree condition did the subject have sufficient time to get to the desired point of interception <u>easily under all conditions</u> and yet still have to make a definite move to the right or left. In addition, this variation in horizontal angle of projection also provided for easily recognizable differences in object trajectories in terms of the horizontal direction of object flight. For these reasons, then, the five degree (5^{0}) horizontal angle of projection was selected

<u>Estimation of the Values of the Speed and Vertical Angle Variables</u>. Fifty (50) balls were projected at each of the four combinations of speed and vertical angles of projection previously selected for use in the study to determine the numerical values of these speed and vertical angle of projection variables. These combinations included: Fast Speed-High Angle; Fast Speed-Low Angle; Slow Speed-High Angle; and Slow Speed-Low Angle. The procedure used in estimating these figures was as follows. The time of flight of each object projection was measured to the nearest one-hundredth of a second and the horizontal distance of that flight recorded in feet. The height at which objects were projected was constant, 3.5 feet above the ground. The velocity and vertical angle of projection of each of the ball flights was calculated by procedures described by Mortimer (76).

One hundred individual estimates of each of the two speeds and vertical angles of projection were obtained. The average of these one hundred estimates then were the assigned numerical values of these variables. The average values of the one hundred estimates are shown in Table 1, p.33. The two speeds of object projection were identified as: Fast Speed or 48.0 feet per/second and Slow Speed or 39.7 feet per/second. The vertical angles of object projection were: High Angle, 44^{0} 10' and Low Angle, [illegible]4^{0} 22'. Other characteristics of the object trajectories are summarized in Table 3, p. 39.

TABLE 3. CHARACTERISTICS OF OBJECT TRAJECTORIES

	HORIZONTAL DISTANCES				VERTICAL DISTANCE	TIME	
CONDITION	Total	High Point	3' Above Floor	4' Above Floor	TO HIGH POINT	Total	To High Point
Slow-High	50.58'	23.54'	47.67'	47.08'	16.59'	1.87	.884
Slow-Low	53.9 '	24.65'	49.82'	49.30'	13.71'	1.65	.777
Fast-High	68.5 '	32.15'	65.07'	64.26'	18.16'	2.03	.938
Fast-Low	72.25'	32.98'	66.73'	65.96'	13.72'	1.71	.776

Consistency of Object Projections. The standard deviation of the distribution of end points of fifty (50) object projections was used as an estimate of the consistency with which the machine projected balls to the same spot, trial after trial. Since the consistency of object projections could logically be assumed to be the same regardless of horizontal angle of projection, balls were projected at a single horizontal angle (0°) and standard deviations for flights based on speed and vertical angles of projection only were determined.

The distribution of the landing points of the four main object trajectories are shown in Figures 2,3,4 and 5 on pages 40-43. Means and standard deviations were calculated for both right-left and short-long deviations in landing points. These figures are shown in Table 4, p. 44. In general, the variability in the landing points of the four object trajectories was minimal. Balls projected at a 44° vertical angle of projection appeared to be slightly more variable than those projected at 34°.

FIGURE 2. DISTRIBUTION OF LANDING POINTS OF 50 OBJECT PROJECTIONS: FAST-HIGH CONDITION

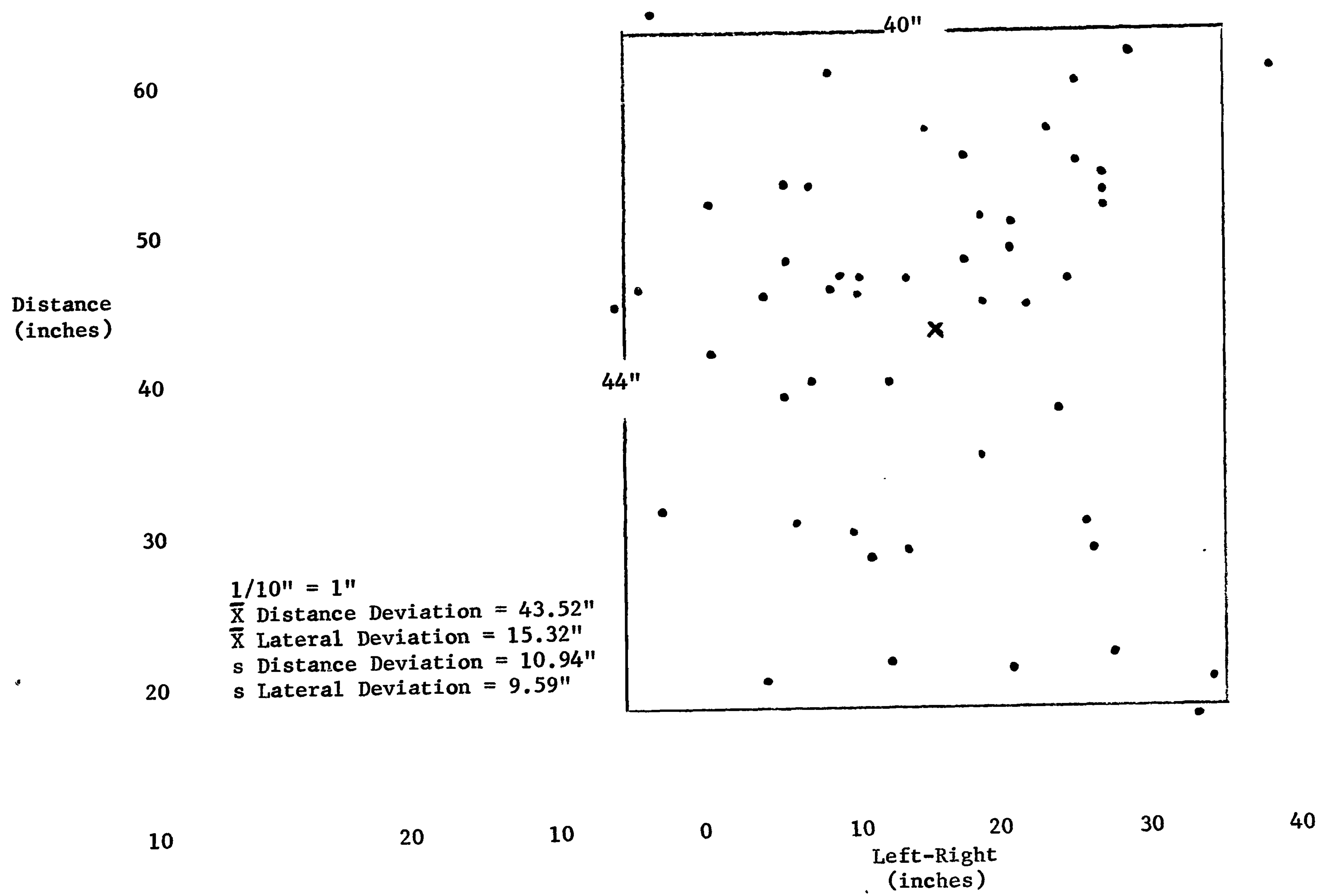


FIGURE 3. DISTRIBUTION OF LANDING POINTS OF 50 OBJECT PROJECTIONS: FAST-LOW CONDITION

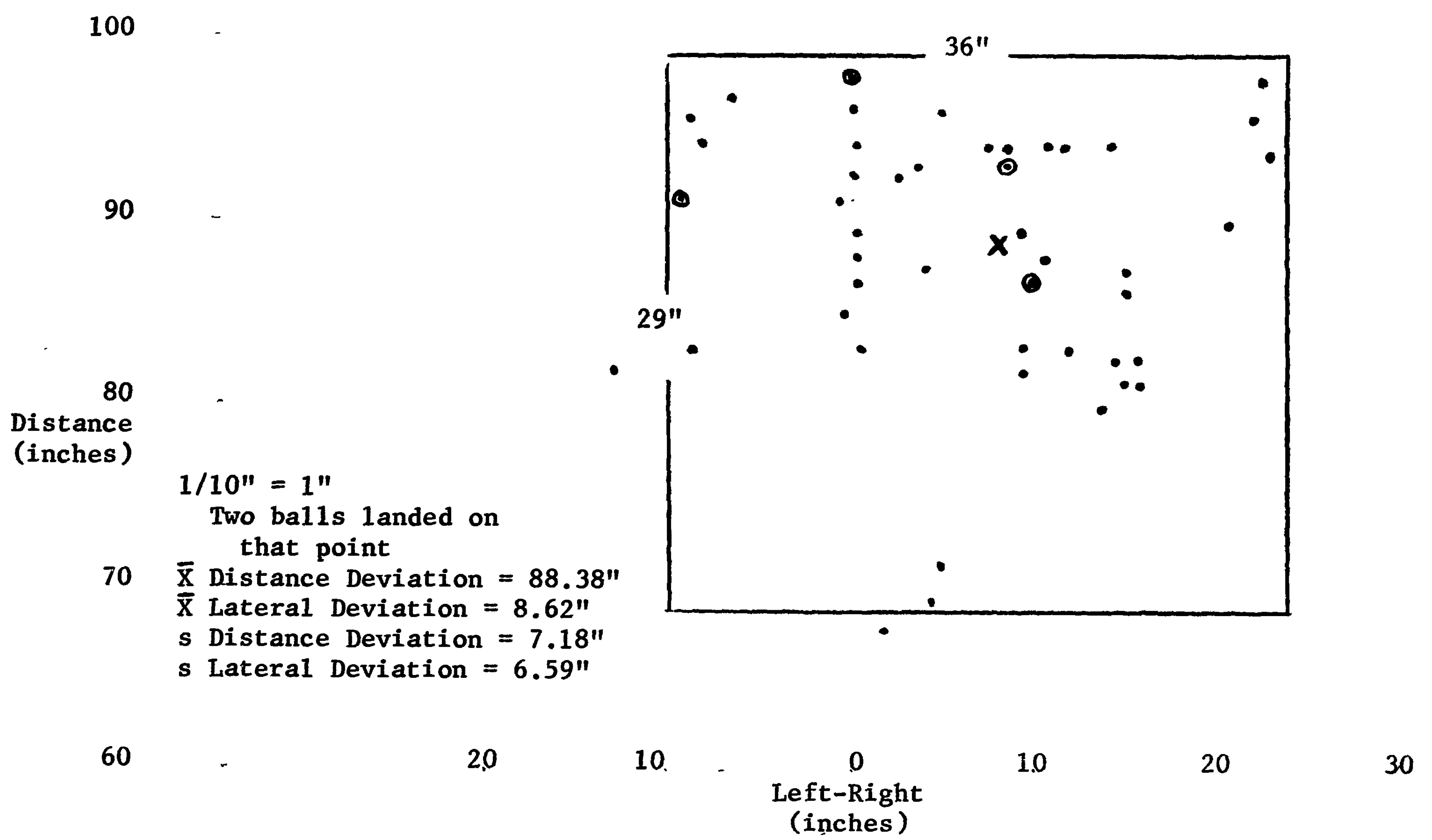


FIGURE 4. DISTRIBUTION OF LANDING POINTS OF 50 OBJECT PROJECTIONS: SLOW-HIGH CONDITION

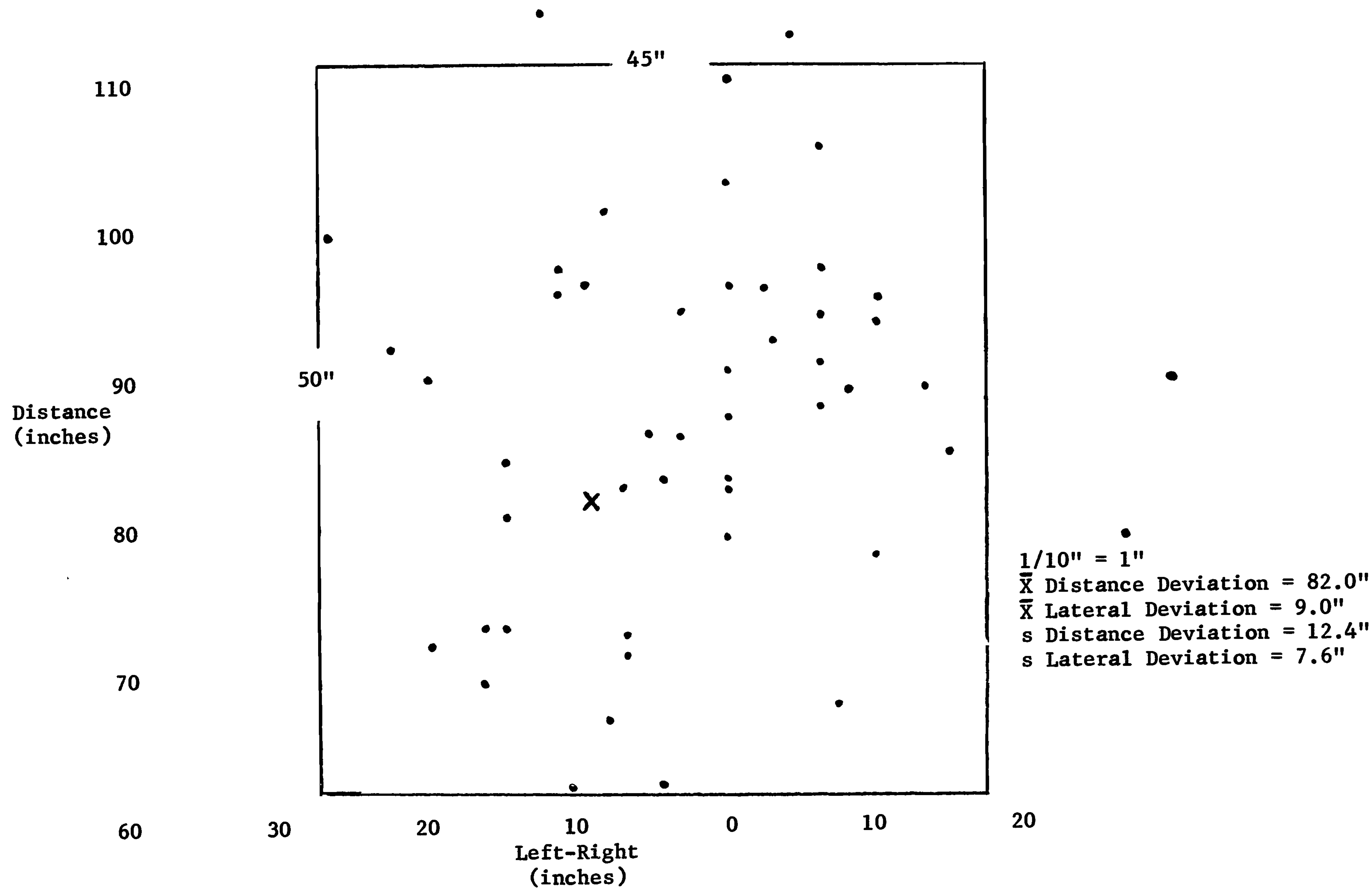


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FIGURE 5. DISTRIBUTION OF LANDING POINTS OF 50 OBJECT PROJECTIONS: SLOW-LOW CONDITION

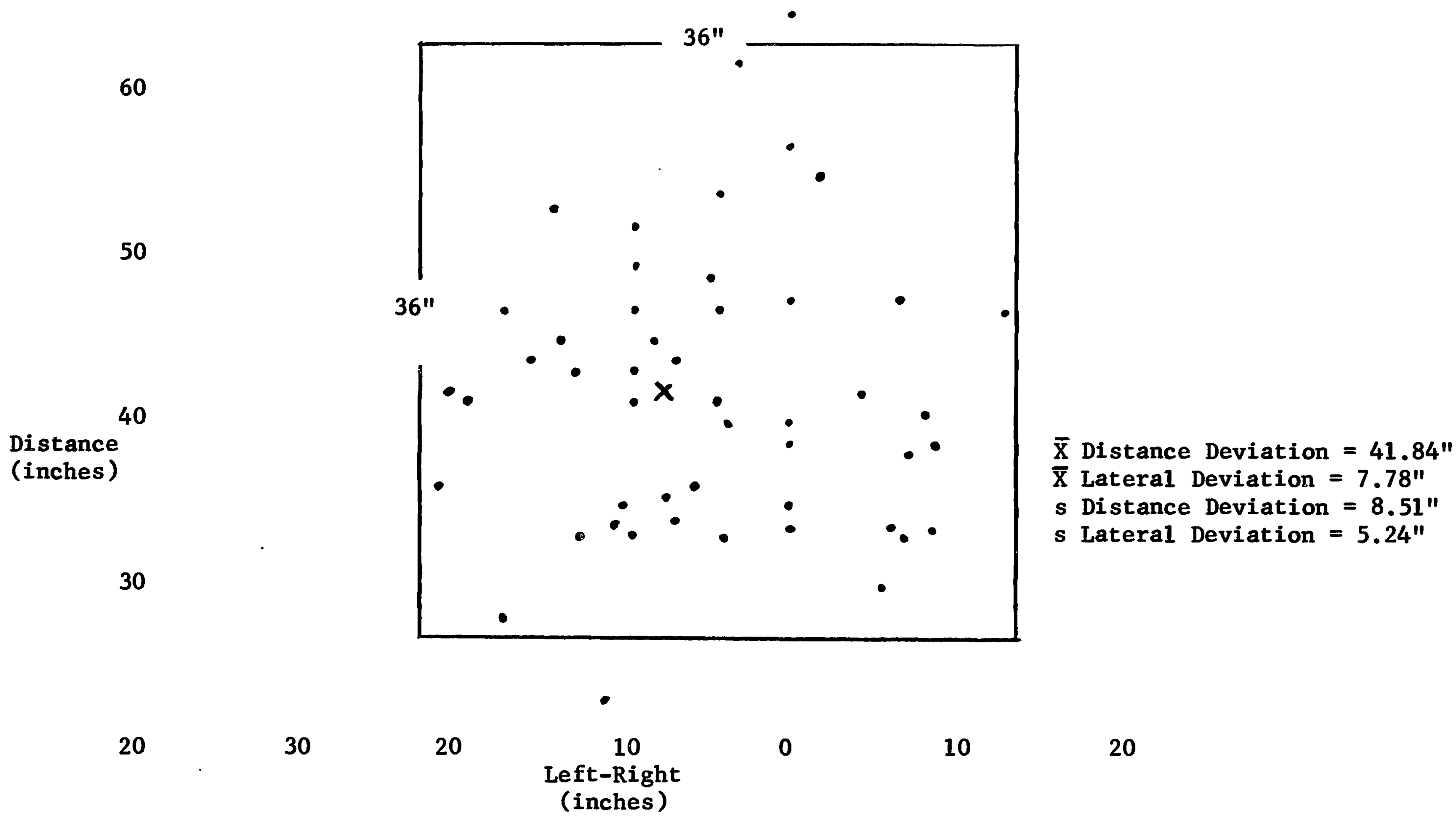


TABLE 4. SUMMARY TABLE: MEANS, STANDARD DEVIATIONS, AND RANGE OF THE DISTRIBUTION OF LANDING POINTS OF 50 OBJECT PROJECTIONS (IN INCHES)

	SLOW SPEED-HIGH ANGLE		SLOW SPEED-LOW ANGLE		FAST SPEED-HIGH ANGLE		FAST SPEED-LOW ANGLE	
	Dist. Dev.	Lat. Dev.	Dist. Dev.	Lat. Dev.	Dist. Dev.	Lat. Dev.	Dist. Dev.	Lat. Dev.
MEAN	82.0"	9.0"	41.84"	7.78"	43.32"	15.32"	88.38"	8.62"
STANDARD DEVIATION	12.4"	7.6"	8.51"	5.24"	10.94"	5.59"	7.18"	6.59"
RANGE	52.0"	45.0"	42.00"	43.00"	47.00"	44.00"	31.00"	38.00"
NO. WITHIN OAOI*	46		48		46		48	
DIMENSIONS OF OAOI*	50" X 45"		36" X 36"		44" X 40"		29" X 36"	

*Optimum area of interception

MEASURES OF THE VISUO-PERCEPTUAL PERFORMANCE. Measures of the visuo-perceptual performance included reaction time, movement time, and three measures of the accuracy of the spatial judgment.

Reaction Time. Reaction time was defined as the period of time elapsing between the projection of the ball from the Ball-Boy machine and the subject's first gross overt movement toward the spot on the floor where he judged he should be to intercept the ball at chest height.

To measure reaction time, an electical circuit was set up so that a clock, Glock A, on the Hale Reaction Timer was started simultaneously with the projection of the ball. (See Appendix A, p.   for a detailed description of this circuit.) The circuit was closed and the clock stopped when the subject moved away from his initial starting position. Time was recorded to the nearest one-hundredth of a second. This measure served as an estimate of the speed with which visual judgments of the flight of the tennis ball were made.

Movement Time. Movement time, defined as the time elapsing between the subject's first gross overt movement away from his original starting position and his arrival at his 'selected' point of interception was measured by a second electrical circuit. This circuit was arranged so that a Dekan Timer was started when the subject stepped off the footpad. The Dekan timer was stopped manually by the experimenter when the subject came to a complete stop at his 'selected' point of interception. Time was again recorded to the nearest one-hundredth of a second and measured the time required by the subject to get to his 'selected' point of interception.

THE OPTIMUM AREA OF INTERCEPTION. To establish a basis for measuring the accuracy of the subject's spatial judgment, the concept of an 'optimum area of interception' was outlined. The logic behind the derivation of this concept was as follows. First, a 'good' or 'successful' catch may be defined in terms of the position in which the object is intercepted in relationship to the body. For example, a 'good' catch might be one in which the ball is intercepted in front of the body at waist height or as one in which the ball is intercepted at the side of the body at shoulder level, and so on. Thus a 'good' catch may be distinguished, operationally, from a 'poor' catch simply by stating the height and the spatial position in relation to the body in which the ball is to be intercepted.

Such a definition of catching performance leads to the concept of an 'optimum point of interception'. If a catching performance is defined in terms of the height and spatial position (relative to the body) in which the ball is to be intercepted, it follows then that there must exist an identifiable point or position in space where the individual must be if he is to contact or catch the object successfully. That is, for any catching performance, defined in the above terms, there exists an 'optimum point of interception', the exact value of which is definable.

Without the aid of precise measuring devises to detect minute differences in body position, however, it seemed reasonable that an individual might assume and/or occupy a number of positions in space and still be subjectively judged as having intercepted the ball in an appropriate manner. In addition, some inconsistency, due to variation in the projection mechanism of the machine itself, was known to exist in the various ball flights. This made the concept of a single point of object interception untenable. Therefore an attempt was made to define that range of points in space within which an individual might position himself and still successfully catch an object according to some set standard. This gave rise to the concept of Optimum Area of Interception. For purposes of this study, then, the concept of an 'optimum area of interception' was adopted and defined as that 'spatial area within which an individual must position himself in order to catch a tennis ball in front of the body, at chest height, with the performer in an upright position and the arms held close to the body.'

Dimensions of the Optimum Area of Interception. An optimum area of interception was established for each of the twelve conditions of object projection. The dimensions of these twelve optimum areas of interception were determined as follows:

(1) First, a 'good' catch was defined, in conjunction with the definition of the 'optimum area of interception', as a ball intercepted at chest height with the body in an upright position and the arms

close to the body. This particular definition of catching performance was adopted because it appeared to be most similar to the position in which baseball outfielders catch 'easy' fly balls.

(2) The average height of subjects in each of the age groups involved in the study was determined. (See Appendix A, p.138 .) Reference to the human factors literature (7,73) indicated that average chest height for these age-height groups was: junior high - three feet; high school and college - four feet.

(3) The optimum <u>point</u> of interception for balls projected under each of the twelve conditions of speed, vertical and horizontal angles of projection was established. These optimum points of interception were based on estimates of the horizontal distance covered by the object in its flight when at heights three and four feet above the floor. These values are shown in Table 3, p. 39. Since the differences in horizontal distance of object flights at points three and four feet above the floor were negligible, a single height, the three foot height of interception, was arbitrarily adopted and used in defining the initial dimensions of the optimum areas of interception for all age groups.

(4) The range, mean, and standard deviation of each of the eight distributions of the landing points of 50 object projections were then used as a guideline in establishing the original dimensions of the optimum areas of interception. (See Table 4, p. 44.) For purposes of pilot investigations, the dimensions of the optimum areas of interception were <u>arbitrarily</u> set at four times the standard deviation of the distribution of landing points of the

original 50 object projections. The original dimensions of the various 'optimum areas of interception' are shown in Table 4, p. 44.

Experimental Evaluation of the Dimensions of 'Optimum Areas of Interception'. Using the average horizontal distance covered by the object in its flight as the center point, 'optimum landing areas' for all twelve object flights, based upon the dimensions shown in Table 4, p.44, were outlined on the gymnasium floor with masking tape. Twenty balls were then projected to each of these areas to determine whether or not balls projected from the machine would, in fact, land within the areas outlined. Results shown in Table 5, p. 49 indicated that a minimum of nineteen of the twenty balls projected from the machine landed in each of the areas as outlined.

Further experimentation was then undertaken: (a) to determine whether or not the size of these areas was adequate to accomodate the various foot positions which subjects might assume in their efforts to reach a 'selected' point of interception quickly, and (b) to determine if subjects could intercept balls in the manner prescribed when positioned outside boundaries of the optimum area of interception as originally defined. Two freshman women enrolled in the General College Physical Education program at the University of Toledo served as subjects in the investigation of these problems. Both subjects were approximately 5'4" tall.

Problem I. Using the 'optimum point' of interception as the center point, four optimum areas of interception, based on all possible combinations of speed and vertical angle of projection, were outlined on the gymnasium floor. Each subject was instructed to stand, in turn, in the center of each of the outlined areas of interception and to catch each ball projected from

TABLE 5. NUMBER AND PERCENTAGE OF 60 BALLS LANDING IN OUTLINED OPTIMUM AREAS OF INTERCEPTION

CONDITION	NUMBER LANDING IN OUTLINED AREA	% LANDING IN OUTLINED AREA
Fast-Right-Low	20	100
Fast-Center-Low	20	100
Fast-Left-Low	20	100
FAST-LOW	60	100%
Fast-Right-High	20	100
Fast-Center-High	19	95
Fast-Left-High	20	100
FAST-HIGH	59	98.3%
Slow-Right-Low	20	100
Slow-Center-Low	20	100
Slow-Left-Low	19	95
SLOW-LOW	59	98.3%
Slow-Right-High	19	95
Slow-Center-High	19	95
Slow-Left-High	20	100
SLOW-HIGH	58	96.7%

the machine in front of the body at chest height with the body in an upright position and the arms held close to the sides. Thirty balls were then projected to each subject while she stood in each of the four areas. The 'successfulness' of each individual catching performance was subjectively judged by the Experimenter. At no time were subjects permitted to step outside the masking tape boundaries to catch a ball.

Results indicated that when subjects were positioned within a given 'optimum area of interception' and allowed to move freely within that area, over 95% of the balls projected to that area were caught in the manner prescribed. The foot position assumed by the subject appeared to have little effect upon the general catching performance. (For specific percentages of balls successfully caught in each area, see Table 6 below.)

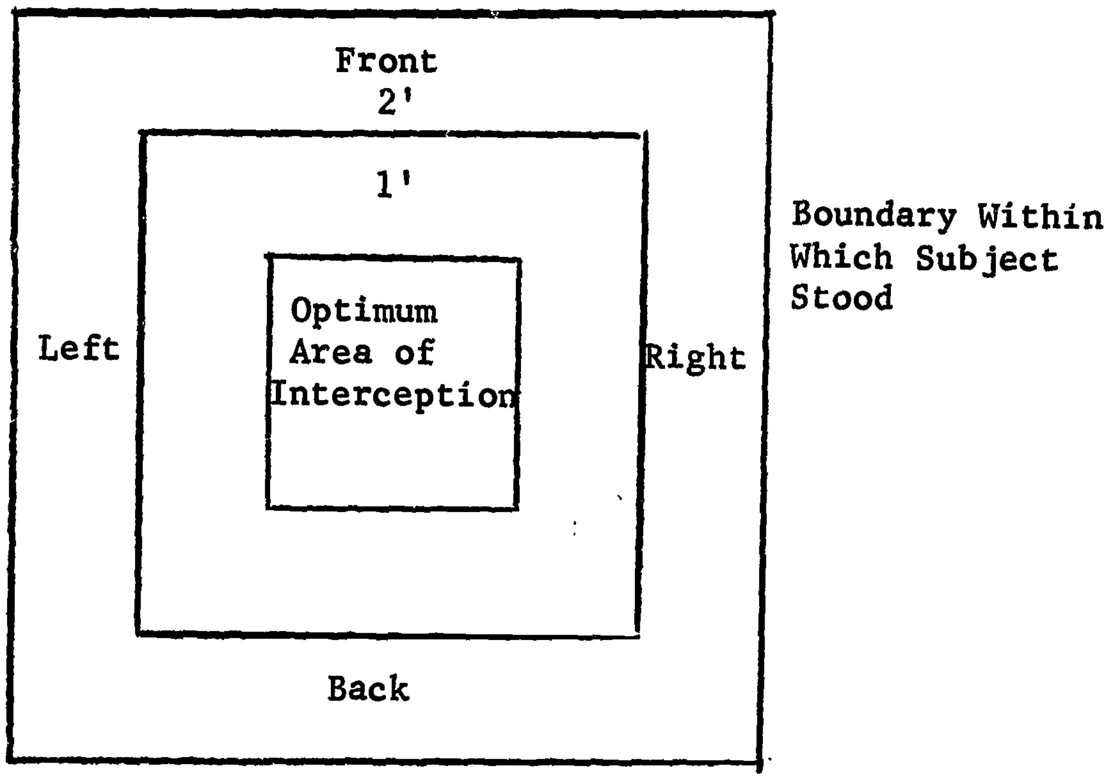
TABLE 6. PILOT INVESTIGATION I: NUMBER AND PERCENTAGE OF 60 BALLS CAUGHT WITHIN OPTIMUM AREA OF INTERCEPTION

CONDITION	TOTAL NO. CAUGHT	% CAUGHT
FAST-LOW	59	98.3%
FAST-HIGH	57	95.0%
SLOW-LOW	58	96.7%
SLOW-HIGH	57	95.0%

Problem II. An additional pilot investigation was undertaken to determine whether or not balls could be 'successfully' caught outside the optimum area of interception. To investigate this problem, additional lines were placed at one and two foot intervals beyond the edges of the original boundary lines of the optimum areas of interception. See Figure 6, p. 51. Each subject was positioned, in turn, at a point within these boundary lines. Ten balls were projected to each subject while she stood in each of four different positions: in front, in back, to the right, and to the left of the four main optimum areas of interception. This procedure was carried out separately for the one and two foot boundary line areas.

Subjects were instructed to catch the balls as they had in the previous investigation. The 'goodness' of each catching performance was judged by the Experimenter, and subjects again were not permitted to step outside the boundary lines in any direction in order to catch a ball.

FIGURE 6. PILOT INVESTIGATION II: BOUNDARY LINES ADDED TO OPTIMUM AREAS OF INTERCEPTION



The results of each of these series of object projections are shown in Table 7, below. Observation of the 'successful' catching perf~~mance for all areas indicated that only eight of 320 balls projected were caught 'successfully' within one foot of the original boundary of the 'optimum areas of

TABLE 7. PILOT INVESTIGATION II: NUMBER OF BALLS 'SUCCESSFULLY' CAUGHT WITHIN THE ONE AND TWO FOOT BOUNDARY AREAS

	ONE FOOT BOUNDARY		TWO FOOT BOUNDARY	
CONDITION	Number Projected	Number Caught	Number Projected	Number Caught
Fast-High	80	2	80	1
Fast-Low	80	1	80	0
Slow-High	80	3	80	2
Slow-Low	80	2	80	0
TOTAL	320	8*	320	3**

*2.5% or approximately 2 out of 96

**0.009%

interception'. That is, only 2.5% of the balls projected were successfully intercepted by subjects standing somewhere within a one foot distance of the 'optimum area of interception' as originally defined. When positioned two feet away, only three successful catches were made. This is less than .01% of the total number of balls projected.

Based on these observations, then, the dimensions of the 'optimum areas of interception' as originally defined were adopted for use in this study. These areas are shown schematically in Figure 7, p. 53.

Measures of the Spatial Judgment. Measures of the spatial judgment consisted of the deviation, in inches, of the subject's final position in space from the appropriate area of interception and included distance or depth error, lateral deviation or right-left error, and absolute error or radial deviation.

1. Radial Error. Radial errors, represented by the Line BC in Figure 8, p. 54, consisted of the absolute deviation (in inches) of the subject's 'selected' position on the floor from the nearest edge of the 'optimum area of interception'. This provided an estimate of the overall precision of the individual's spatial judgment.

2. Distance Error. Distance errors, shown in the diagram (Figure 8, p. 54) by the line CD, consisted of the front-back deviations (in inches) of the subject's final position on the floor from the nearest edge of the square defining the 'optimum area of interception'. This measure provided an estimate of the distance or depth error made by the subject in judging the flight of the moving object.

3. Lateral Error. Lateral errors, represented in the diagram (Figure 8, p. 54) as the Line BD, were the right-left deviations (in inches) of the

FIGURE 7. SCHEMATIC REPRESENTATION OF THE SIZE AND LOCATION OF THE TWELVE 'OPTIMUM AREAS OF INTERCEPTION'

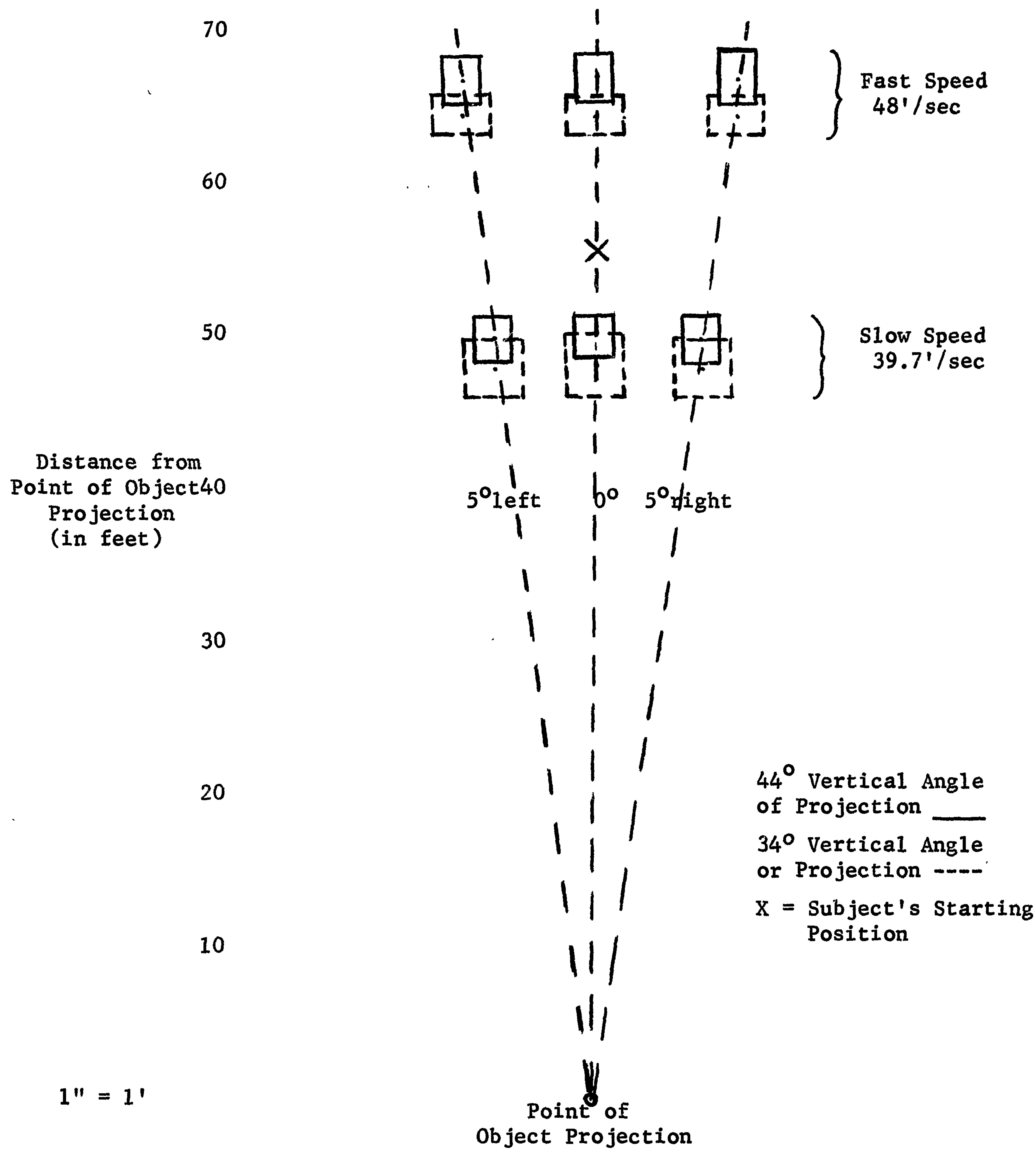
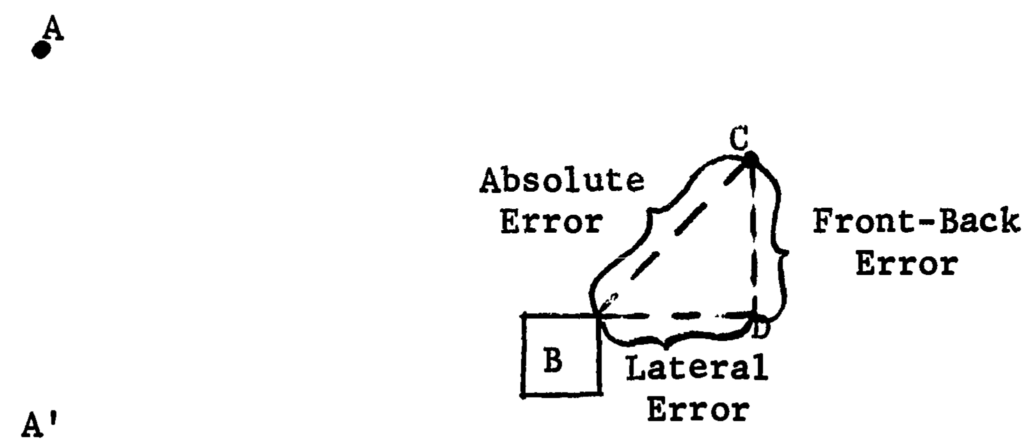


FIGURE 8. DIAGRAMMATIC REPRESENTATION OF THE MEASURES OF THE SPATIAL JUDGMENT



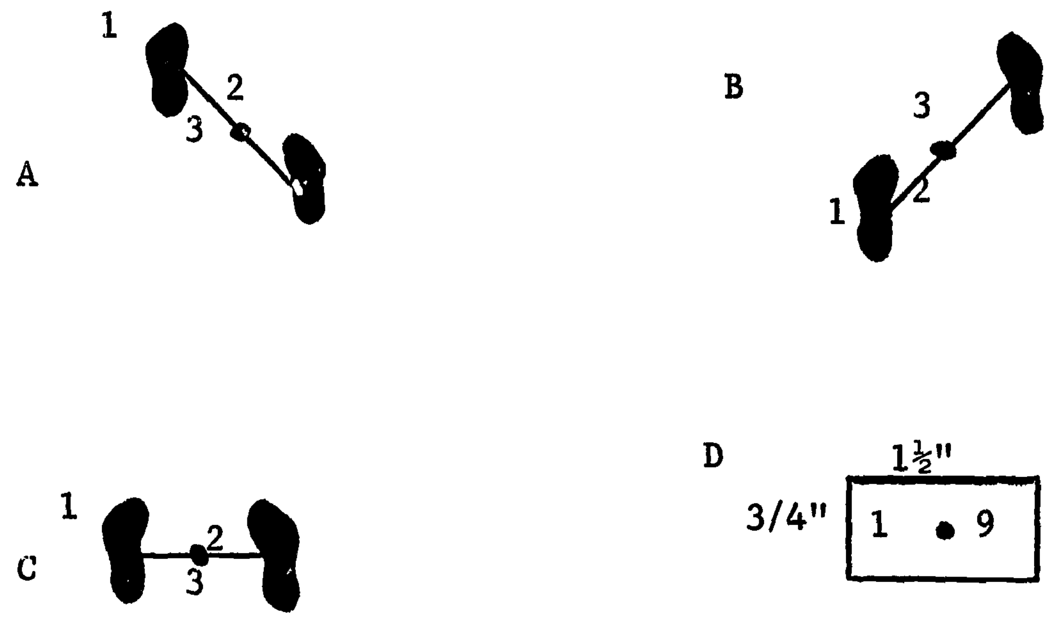
A = Point of Object Projection
A = Subject's Starting Position
B = Optimum area of Interception
C = Subject's 'Selected' Points of Interception

Line BC = Radial or Absolute Error
Line BD = Lateral or Right-Left Error
Line CD = Front-Back or Depth Error

subject's final position in space from the nearest edge of the square defining the 'optimum area of interception'. This measure provided an estimate of the accuracy of the visual judgments of the subject in terms of right-left error.

Determination of the Subject's Selected Point of Interception. The subject was instructed to remain in the position which he had selected as the optimum point of interception until it had been appropriately marked by the Experimenter. The position assumed by the subject was indicated by placing a piece of masking tape, on the floor, at the center point of a straight line extending between the two insteps of the subject's feet. See Figure 9, p. 55. The insteps of the feet served as the points of origin of this straight line, and a small plastic ruler was used to estimate its center point. This particular technique for indicating the subject's 'selected' point of interception was adopted because it seemed to provide the best possible estimate of the center point of the subject's total body position.

FIGURE 9. METHOD USED TO ASSESS SPATIAL POSITION ASSUMED BY SUBJECTS WHEN JUDGING MOVING OBJECTS



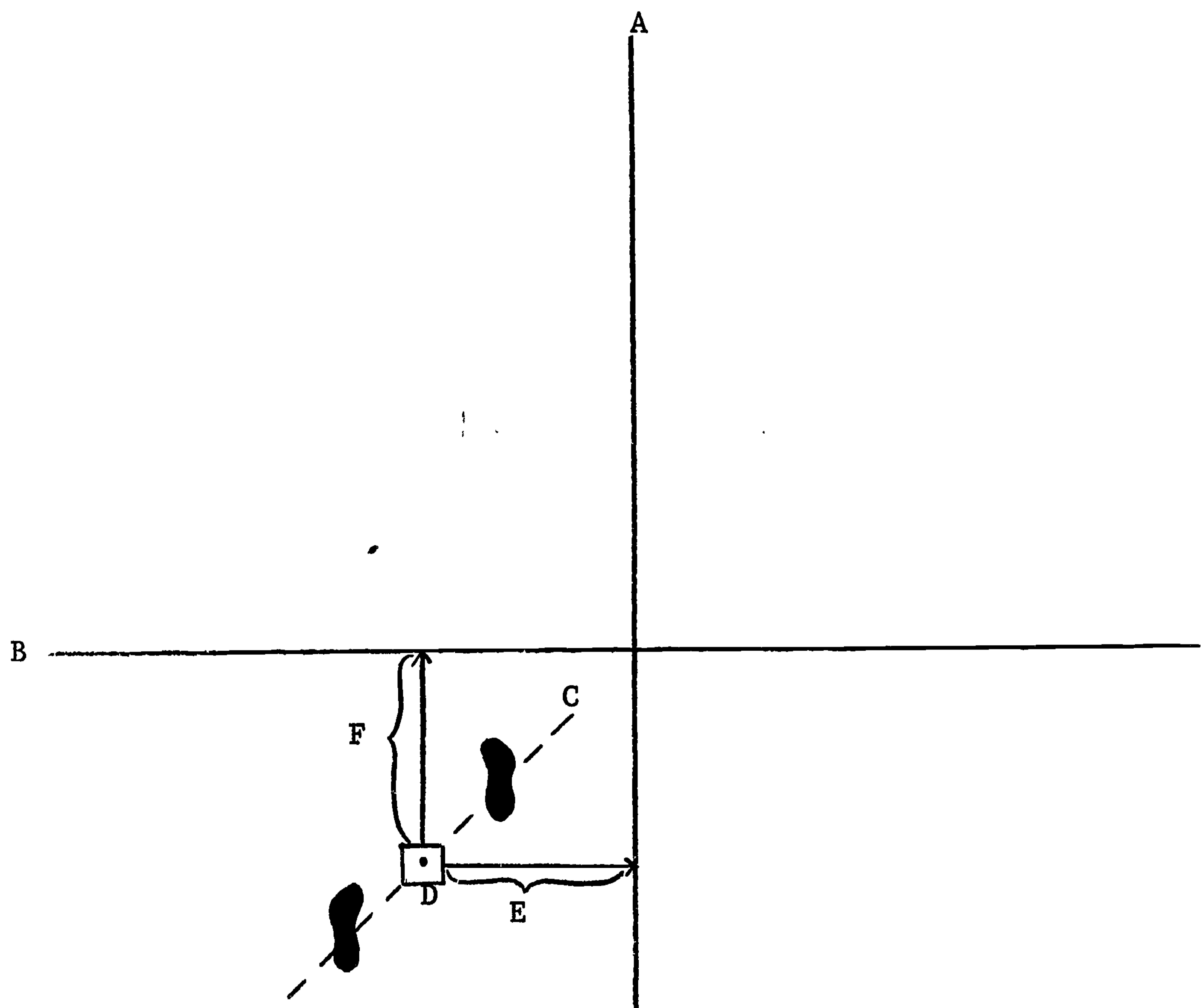
A,B,C = Various Foot Positions Assumed by Subjects

1 = Final Foot Position of Subject
2 = Straight Line Between the Two Feet
3 = Center of Line and Point At Which Masking Tape Was Placed on Floor
D = Masking Tape, Marked With Subject and Trial Numbers

<u>Initial Assessment of the Accuracy of the Spatial Judgments</u>. Subject and trial numbers were marked in indelible ink on the masking tape. A large black dot, placed in the center of each individual piece of masking tape, was used as a reference point for all measurements taken on a given spatial judgment. (See Figure 9-D, above.) Once the subject had completed his total series of trials, the distance from this black dot to the center of two lines, one running the length, the other the width of the gymnasium was measured. Distances were measured to the nearest inch. (See Figure 10, p. 56)

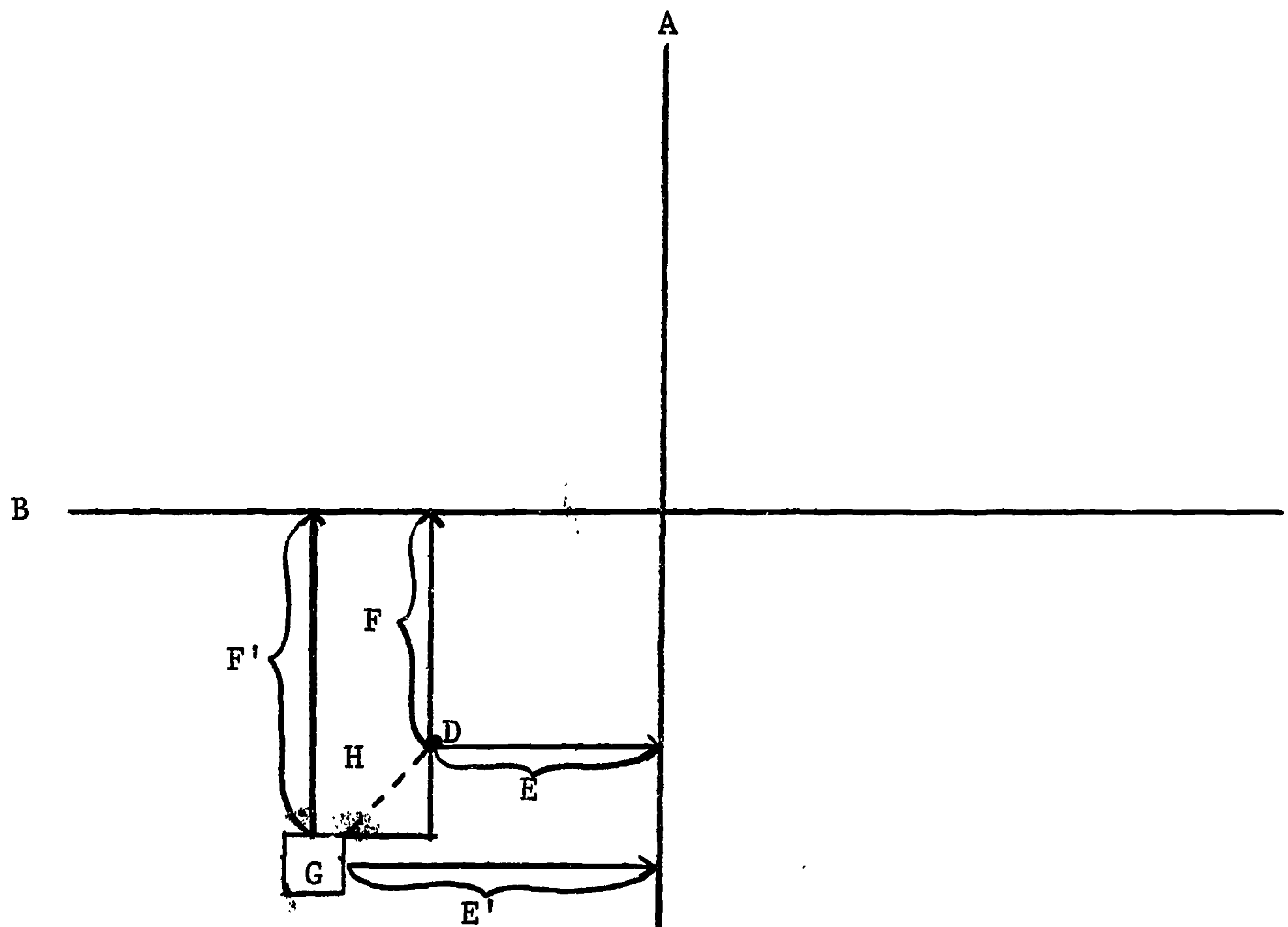
Raw scores thus obtained were later converted to deviation scores by a procedure shown schematically in Figure 11, p. 57. Initially, the distance, in inches, of each optimum area of interception from the two reference lines

FIGURE 10. METHOD USED TO MEASURE SPATIAL JUDGMENTS OF SUBJECTS

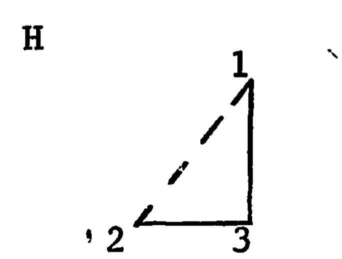


A = Line running length of gymnasium
B = Line running width of gymnasium
C = Final foot position of subject
D = Masking tape placed at center of straight line between feet
E = Distance, measured in inches, from Line A
F = Distance, measured in inches, from Line B

FIGURE 11. METHOD USED TO MEASURE SPATIAL JUDGMENTS OF SUBJECTS (CONT'D)



A = Vertical reference line
B = Horizontal reference line
D = Subject's stopping point
G = Optimum Area of Interception
E'= Distance, in inches, of Optimum Area of Interception from Line A
E'-E = Lateral (right-left) error
F'= Distance, in inches, of Optimum Area of Interception from Line B
F'-F = Distance (depth) error
H = Radial (absolute) error



23 = E' - E or lateral error
13 = F' - F or distance error
12 = H or radial error

previously described was determined. Next, the raw score values previously obtained were subtracted from the appropriate values determined above. This provided a set of distance and lateral deviation scores. The Pythagorean Theorum ($A^2 = B^2 + C^2$), where B^2 = distance deviation^2, C^2 = the lateral deviation^2 and A^2 = radial error^2 was employed to derive a set of absolute or radial error scores.

Reliability of the Performance Measures. A preliminary investigation was undertaken to assess the reliability of each of the performance measures to be used in the study. These measures included reaction time, movement time, lateral deviation, and distance deviation. Twenty college freshmen men served as subjects for this investigation. Each subject was given three trials per condition, 36 trials in all. An analysis of variance was employed to estimate the reliability of each of the measures for each of the twelve treatment conditions. The Spearman-Brown prophecy formula, $r' = \frac{2r}{1 + r}$, was used to predict the number of trials necessary to reach a minimum reliability of .80. The reliability coefficients and the projected number of trials required to reach the standard reliability criterion of .80 are shown in Table 8, p.59.

With the exception of the lateral deviation measures (in particular those at the slow speed of object projection), the projected reliabilities of the majority of the performance measures reached and/or surpassed the criterion standard of .80 in six, seven, or eight trials. Reliabilities were then predicted for the various performance measures with the number of trials set at eight. These are shown in Table 9, p. 60.

TABLE 8. RELIABILITY ESTIMATES AND NUMBER OF TRIALS REQUIRED TO OBTAIN A PROJECTED RELIABILITY OF .80

TREATMENT CONDITION	REACTION TIME		MOVEMENT TIME		DISTANCE DEVIATION		LATERAL DEVIATION	
Hor Vert Speed-Dir-Dir	r(3T)	Trials to .80	r(3T)	Trials to .80	r(3T)	Trials to .80	r(3T)	Trials to .80
Fast-Right-High	.698	6	.712	6	.788	5	.413	8
Fast-Center-High	.465	8	.655	6	.507	8	.504	8
Fast-Left-High	.298	11	.696	6	.634	6	.273	11
Fast-Right-Low	.762	6	.459	8	.683	6	.421	8
Fast-Center-Low	.444	8	.383	9	.763	6	.093	28
Fast-Left-Low	.691	6	.339	9	.679	6	.449	8
Slow-Right-High	.505	8	.654	6	.522	7	.329	10
Slow-Center-High	.214	14	.054	47	.516	7	.186	15
Slow-Left-High	.365	9	.563	7	.607	7	.150	18
Slow-Right-Low	.653	6	.535	7	.782	5	.266	11
Slow-Center-Low	.616	6	.095	28	.519	7	.246	12
Slow-Left-Low	.621	6	.517	7	.887	3	.207	14

TABLE 9. PROJECTED RELIABILITIES WITH A MAXIMUM OF EIGHT TRIALS PER CONDITION

CONDITION	REACTION TIME	MOVEMENT TIME	DISTANCE DEVIATION	LATERAL DEVIATION
F-R-H	1.000	1.000	1.000	.780
F-C-H	.847	1.000	.898	.895
F-L-H	.613	1.000	1.000	.573
F-R-L	1.000	.840	1.000	.791
F-C-L	.821	.739	1.000	.227
F-L-L	1.000	.676	1.000	.827
S-R-H	.896	1.000	.916	.661
S-C-H	.471	.138	.909	.419
S-L-H	.714	.962	1.000	.348
S-R-L	1.000	.931	1.000	.561
S-C-L	1.000	.227	.912	.527
S-L-L	1.000	.909	1.000	.458

With the number of trials set at eight, all of the reliabilities for the distance deviation measures were well above the criterion standard of .80. Only one reaction time and two of the movement time measures were completely unacceptable. In the case of the lateral deviation measures, however, more than half did not meet the specified standard set. In terms of practical limitations on the subject's time, interest, and efficiency, it was not feasible to increase the number of trials beyond eight or nine per condition. Since the majority of the performance measures reached or exceeded the criterion standard of .80 with eight trials, the number of trials per condition was set at eight each. Although the lateral deviation measure was, theoretically, not reliable with this number of trials, it was included in the investigation in order that is might be studied in more detail. Reliability coefficients of subject performances in the experiment proper are reported in the Results Section, p. 70

SELECTION OF SUBJECTS. A total of fifty-four (54) subjects participated in the study. Eighteen (18) subjects each were randomly selected from a carefully defined population of male students enrolled in junior high school, senior high school and college. The average age of each of these groups was: junior high - 12 years; senior high - 16 years; and college - 20 years. Of the eighteen subjects selected from each age group, nine were classified as skilled and nine as unskilled.

General Procedures.

A. Junior and Senior High School Population. Initial contact was made with the Junior and Senior high school students during their regularly scheduled physical education class period. At this time, a total of 175 senior high and 150 junior high male students filled out an 'Experience Questionnaire', indicating in detail the amount of baseball experience each had had prior to that time. (For a detailed description of this questionnaire, see Appendix, p. 137.) On the basis of the responses to this questionnaire form, students were divided into two groups: (a) varsity or experienced baseball players and (b) individuals with little or no baseball experience. Forty (40) subjects were then randomly selected from each of the two major skill classifications. A total of 80 subjects from each of the junior high and high school age populations were thus selected and subsequently given the following tests: (a) the overarm throw for velocity, (b) the Snellen Test for visual acuity and (c) the Depth Perception Apparatus test. (For a description of this test, see Appendix A, p. 133.)

B. College Population. The skilled segment of the college age population was secured through the varsity baseball coach at the University of Toledo. The coach was contacted in the fall, the nature and purpose of the experiment explained to him, and his consent to have members of the varsity baseball team participate in the experiment obtained. The Overarm Throw for Velocity, visual acuity and depth perception measures were taken on all members of the varsity baseball team during subsequent weekend baseball practices. The final sample of college-age-skilled subjects were randomly drawn from the varsity baseball population.

For the unskilled segment, 150 students enrolled in six (6) different sections of the General College Physical Education Program at the University of Toledo were contacted and given the 'Experience Questionnaire'. On the basis of the responses to this questionnaire, the sixty (60) subjects with the least amount of baseball experience were selected and later given the Overarm Throw for Velocity, visual acuity and depth perception tests. (See Appendix, p.133-135)

Criteria for Skill Classifications. Assignment to a particular skill classification was based upon a double criterion.

A. Primary Criterion. The primary criterion used for classifying subjects as skilled or unskilled was an 'experience' factor which was defined as follows:

1. Skilled Classification.

a. High School and College Age Groups. Subjects assigned to this skill classification were those individuals who were presently involved in interscholastic or intercollegiate baseball competition and who had been a member of the varsity baseball squad at their respective institutions for at least one year prior to the school year, 1966-1967. Pitchers and catchers were automatically eliminated from the active subject population since these positions do not ordinarily involve the judging of fly balls.

b. Junior High Age Group. Only those junior high boys who had had a minimum of three years of experience in organized Little League and/or Babe Ruth League baseball competition were classified as skilled individuals.

2. Unskilled Classification.

a. High School and College Age Groups. Subjects assigned to this 'unskilled' group were individuals who were not presently involved in interscholastic or intercollegiate baseball competition and who were not presently or ever had been a member of a varsity baseball squad.

b. Junior High Age Group. Individuals in this category were those junior high school males who were not presently involved in and who had never had experience in organized Little League and/or Babe Ruth League baseball competition.

B. Secondary Criterion. The secondary criterion for classifying individuals as skilled or unskilled was a performance measure, the Overarm Throw for Velocity. The overarm throw for velocity is of course not a perfect indicator of skill in the game of baseball. Most baseball experts will agree, however, that the ability to throw an accurate and well-timed ball from (or to) various locations on the playing field is an important part of the overall game of baseball. Thus individuals who cannot or do not throw well are not likely to become or remain members of organized or competitive baseball groups. (This measure was employed primarily to provide some quantitative basis for identifying the two levels of skill and to aid in more clearly identifiying those individuals in the 'unskilled' category.)

1. Skilled Classification. The skill classification for each age group consisted of those individuals whose scores were included in the top 25% of a distribution of scores based upon performances on the Overarm Throw for Velocity test.

2. Unskilled Classification. The unskilled classification for all age groups consisted of those individuals whose scores on the Overarm Throw for Velocity test fell in the bottom 25% of a distribution based upon performances on that test.

Criterion for Visual Acuity and Depth Perception Performance. Only those individuals having a minimum visual acuity of 20/25 in each eye were considered in the final selection of subjects. Since no standard norms were available by which performances on the Depth Perception Apparatus test could be judged, a Two-Way Analysis of Variance was used to determine if significant differences existed between subject groups selected for participation in the experiment in terms of depth perception.

Final Selection of Subjects. Distributions, based on the mean performance scores on the Overarm Throw for Velocity test, were made for each of the subject populations. Individuals whose scores fell in the upper and lower 25% of these distributions were identified and evaluated in terms of amount of baseball experience and visual acuity rating. Using the maximum requirements for baseball experience and performance on the Overarm Throw for Velocity and visual acuity tests previously outlined, a tentative selection of subjects was made. A Two-Way Analysis of Variance was then run on the scores on the Depth Perception Apparatus test to determine if any significant differences existed between the various age and/or skill groups selected. Results of this analysis, shown in Table 10, p. 65, indicated that there were no significant differences between the various groups in terms of depth perception performances.

Eighteen subjects from each of the junior high, senior high, and college age groups were contacted and asked to participate in the experiment. They were scheduled for a specific day and hour for testing.

TABLE 10. ANALYSIS OF VARIANCE: DEPTH PERCEPTION PERFORMANCE BY AGE AND SKILL

SOURCE OF VARIATION	SUM OF SQUARES	df	MEAN SQUARE	F
Skill	.010	1	.010	<1
Age	.043	2	.022	<1
Skill X Age	.167	2	.084	<1
Within	66.840	48	1.390	
Total	67.060	53		

<u>COLLECTION OF THE DATA</u>. Data were collected over a three-month period, beginning in February, 1967, and ending in April, 1967. All testing sessions were conducted in the University of Toledo Fieldhouse, Toledo, Ohio. All subjects were exposed to all twelve combinations of the speed, horizontal and vertical angles of object projection selected previously. Each subject received eight trials per condition or a total of 96 trials in all. Each series of trials was presented in a predetermined random order. (See Appendix B, p.140-154.)

Testors for the project were graduate and undergraduate majors in physical education at the University of Toledo; two undergraduate engineering majors also enrolled at the University of Toledo, and two faculty members of the Department of Physical Education at Bowling Green State University, Bowling Green, Ohio.

Two days prior to the initial data collection session, a special two-hour training session was held in the University Fieldhouse. During this training period, testors were assigned to and trained in their respective tasks. At the completion of the instructional period, two trial runs of the experiment were carried out in order to assure that each testor clearly understood his responsibilities and to clarify any questions which might have arisen about the experimental set-up in general.

Analysis of the Data. The design of the present study may be described as a five-dimensional factorial design with repeated measures on three dimensions. Since several performance indices were involved in the evaluation of the visuo-perceptual performance under investigation, multivariate statistical techniques were directly applicable to the present problem (58,84,86). Of the several multivariate statistical techniques which have been developed recently, Multivariate Analysis of Variance (MANOVA) procedures were selected as most appropriate for the data analysis.

The MANOVA technique has the distinguishing characteristic of combining the outstanding features of both univariate analysis of variance and multiple discriminant analysis techniques into a single analysis (58). More specifically the MANOVA employs the feature of the univariate ANOVA which permits the assessment of the effects of various experimental conditions upon a given behavior or performance and the feature of the multiple discriminant analysis which permits multiple performance measures to be handled in a single analysis.

Unfortunately, at present, most MANOVA programs are relatively undeveloped and thus are, for the most part, limited in terms of use in analyzing any except the simplest multivariate designs. In the case of the present study, the design was too large to be handled appropriately by available MANOVA techniques. Therefore, as an alternative approach, a series of five univariate analyses, using a single performance index per analysis, was employed. These analyses permitted an assessment of the effects, based upon a single behavioral index, of the five main variables of skill, age, speed, vertical and horizontal direction of object flight upon visuo-perceptual performances. Where appropriate, Scheffe's Multiple Comparisons Test was used to compare differences between group means (111).

CHAPTER V

RESULTS

The results of the study are divided into the following sections: (a) Selection of the Level of Significance; (b) Reliability of the Performance Measures; (c) Speed of the Perceptual Response (reaction time); (d) Spatial Accuracy of the Perceptual Response, including distance, lateral and radial deviation analyses; (e) Movement Time; and (f) Summary of the results. Where appropriate, the discussion of results is divided into two main categories: that based upon group characteristics (age and skill) and that based upon stimulus characteristics of the flight of the moving object (speed, horizontal and vertical direction).

SELECTION OF THE LEVEL OF SIGNIFICANCE

Separate univariate analyses of variance were run on each of the reaction time, movement time, and spatial accuracy measures (a total of five analyses). Where appropriate, Scheffe's Multiple Comparisons Test was used to evaluate differences between means. The univariate analyses run and the error terms used were based upon a multi-factor, repeated measurements design suggested by Winer (111). The level of significance for evaluating the F-tests and comparisons among means was set at Alpha .01.

No absolute standards are available to guide an experimenter in selecting a particular level of significance for evaluating the evidence from a given investigation. However, in any multi-factor experiment where several F-tests are obtained, there is always the very serious problem that as the number of F-tests obtained increases, the probability of obtaining one or more spuriously significant results increases as well. In addition, when multiple F-tests are run on data which are not independent, the number of spuriously significant F-tests to be expected by chance is indeed difficult if not impossible to establish (111). The present analyses involved the obtaining of a large number of F-ratios (31 per analysis, 155 in all) on data which were not independent. Therefore, in an effort to minimize the problem of increasing numbers of spuriously significant F-ratios, the one percent level of significance (Alpha .01) was decided upon. It is obvious of course that regardless of the level of significance set, the "evidence provided by a single experiment with respect to the truth or falsity of a statistical hypothesis is seldom complete enough to arrive at a decision which is free of all possible error" (111, p.13).

RELIABILITY OF THE PERFORMANCE MEASURES

Two-Way Analyses of Variance were used to determine the reliability of each of the performance measures. Since differences in skill were, in all cases except one (Movement Time), significant, separate reliabilities were calculated for each of the two skill groups involved in the experiment. These reliability coefficients, grouped according to experimental condition and skill level, are shown in Table 11, p. 70.

With the exception of the Lateral Deviation measure, reliability coefficients for each of the other performance measures (by experimental condition) met or closely approached the criterion standard of .80 originally set. The somewhat lower reliabilities found across all experimental conditions for the Lateral Deviation measure of course raises the question of the meaningfulness of any conclusions based upon the analysis of this performance measure.

SPEED OF THE PERCEPTUAL JUDGMENT. (Reaction Time)

Results of the analysis of the reaction time are shown in Table 12, p. 71.

TABLE 11. RELIABILITY OF PERFORMANCE MEASURES

CONDITION	REACTION TIME Skilled	REACTION TIME Unskilled	MOVEMENT TIME
Slow-Right-Low	.906	.900	.773
Slow-Right-High	.895	.829	.862
Slow-Center-Low	.788	.783	.845
Slow-Center-High	.772	.759	.870
Slow-Left-Low	.801	.767	.853
Slow-Left-High	.860	.803	.858
Fast-Right-Low	.905	.916	.836
Fast-Right-High	.828	.891	.886
Fast-Center-Low	.833	.782	.867
Fast-Center-High	.855	.774	.833
Fast-Left-Low	.677	.604	.793
Fast-Left-High	.741	.692	.864

CONDITION	LATERAL DEVIATION Skilled	LATERAL DEVIATION Unskilled	DISTANCE DEVIATION Skilled	DISTANCE DEVIATION Unskilled	RADIAL DEVIATION Skilled	RADIAL DEVIATION Unskilled
Slow-Right-Low	.496	.373	.677	.863	.654	.850
Slow-Right-High	.622	.684	.828	.843	.822	.832
Slow-Center-Low	.377	.000	.533	.795	.743	.453
Slow-Center-High	.042	.357	.784	.808	.808	.777
Slow-Left-Low	.599	.696	.725	.898	.698	.902
Slow-Left-High	.595	.598	.818	.761	.813	.756
Fast-Right-Low	.748	.807	.814	.856	.829	.865
Fast-Right-High	.647	.642	.700	.865	.681	.868
Fast-Center-Low	.309	.280	.861	.831	.825	.828
Fast-Center-High	.708	.486	.820	.787	.810	.776
Fast-Left-Low	.722	.698	.893	.904	.885	.907
Fast-Left-High	.630	.330	.723	.865	.744	.860

Group Characteristics. As can be seen in Table 12, the main effect of skill was significant. Figure 12, p. 73 indicates that skilled individuals responded significantly more rapidly (.361 seconds) to the moving object in space than did unskilled individuals (.511 seconds). This suggests that the skilled individual made his visuo-perceptual judgment about the flight of the moving object significantly more quickly than did the unskilled person.

TABLE 12. SUMMARY TABLE: ANALYSIS OF VARIANCE - REACTION TIME

Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
Group Characteristics (Between Subjects)					
Age	3.7450	2	1.8725	2.14	5.08
Skill (Sk)	29.3237	1	29.3237	33.54*	7.19
Age X Sk	.2779	2	.1389	.16	5.08
Subjects Within Groups	41.9728	48	.8744		
Flight Characteristics (Within Subjects)					
Speed (Sp)	5.6585	1	5.6585	66.96*	7.19
Age X Sp	.0333	2	.0167	.197	5.08
Sk X Sp	.1170	1	.1170	1.38	7.19
Age X Sk X Sp	.1495	2	.0747	.88	5.08
Sp X Subjects Within Groups	4.0569	48	.0845		
Horizontal Direction	14.2820	2	7.1410	31.98*	4.82
Age X HD	.8611	4	.2154	.96	3.51
Sk X HD	1.1316	2	.5685	2.545	4.82
Age X Sk X HD	.8830	4	.2207	.988	3.51
HD X Subjects Within Groups	21.4347	96	.2233		
Vertical Direction	.1275	1	.1275	3.11	7.19
Age X VD	.0442	2	.0221	.54	5.08
Sk X VD	.0503	1	.0503	1.23	7.19
Age X Sk X VD	.0798	2	.0399	.97	5.08
VD X Subjects Within Groups	1.9659	48	.0410		
Sp X HD	.1429	2	.0715	1.20	4.82
Age X Sp X HD	.1921	4	.0480	.81	3.51
Sk X Sp X HD	.4690	2	.2345	3.95	4.82
Age X Sk X Sp X HD	.3520	4	.0880	1.48	3.51
Sp X HD X Subjects Within Groups	5.7003	96	.0594		
Sp X VD	.2419	1	.2419	6.20	7.19
Age X Sp X VD	.0219	2	.0110	.28	5.08
Sk X Sp X VD	.0010	1	.0010	.03	7.19
Age X Sk X Sp X VD	.0801	2	.0401	1.03	5.08
Sp X VD X Subjects Within Groups	1.8710	48	.0390		

TABLE 12. SUMMARY TABLE: ANALYSIS OF VARIANCE - REACTION TIME (CONT'D)

Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
HD X VD	.3770	2	.1885	3.81	4.82
Age X HD X VD	.1944	4	.0486	.98	3.51
Sk X HD X VD	.0252	2	.0126	.25	4.82
Sk X AGE X HD X VD	.0725	4	.0181	.36	3.51
HD X VD X Subjects Within Groups	4.7852	96	.0498		
Sp X HD X VD	.1794	2	.0897	2.398	4.82
Age X Sp X HD X VD	.1335	4	.0334	.89	3.51
Sk X Sp X HD X VD	.0228	2	.0114	.30	4.82
Age X Sk X Sp X HD X VD	.0294	4	.0074	.198	3.51
Sp X HD X VD X Subjects Within Groups	3.5867	96	.0374		

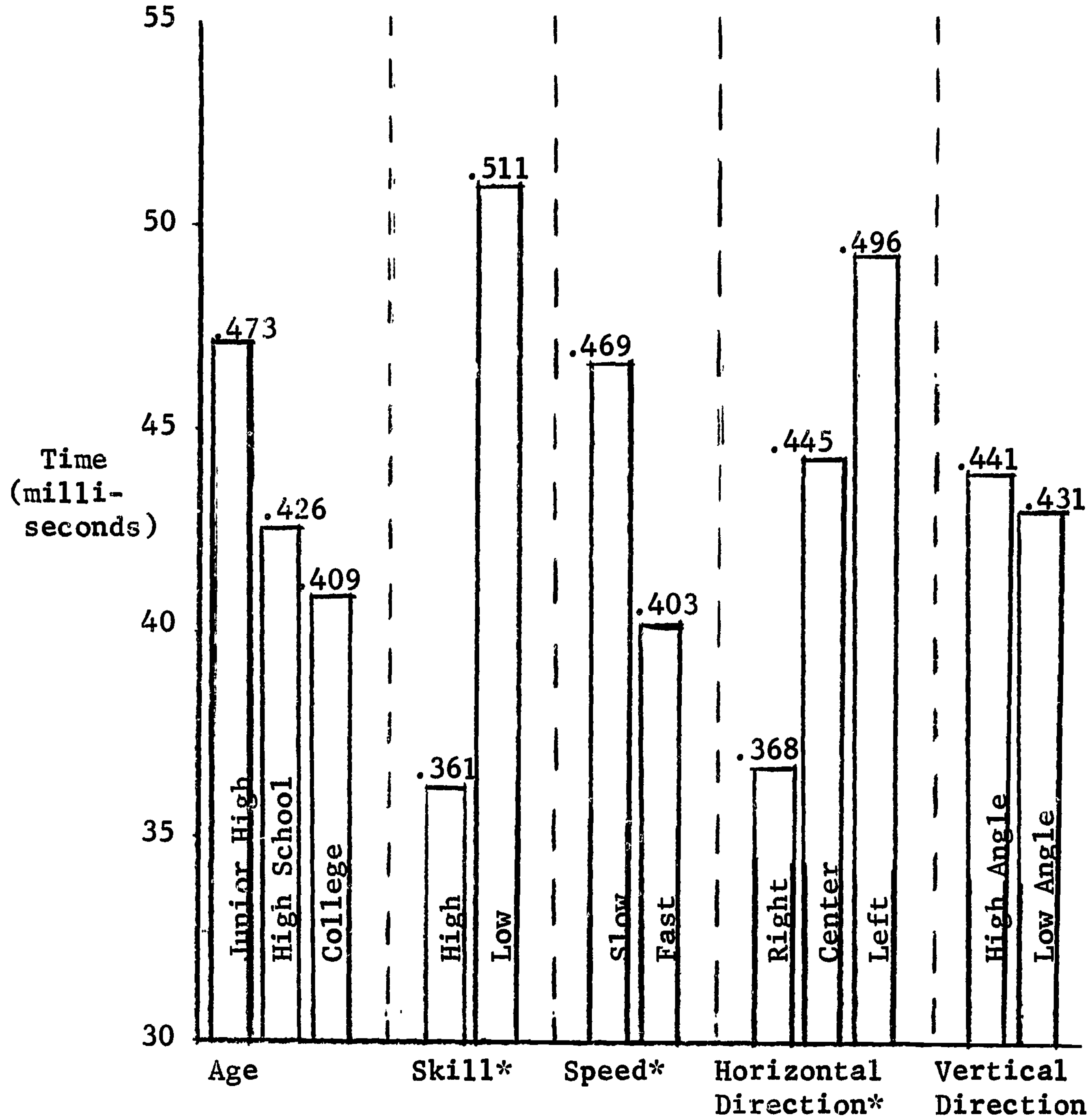
*Significant at .01 level.

The main effect of age was not significant. Thus, although perceptual responses did tend to be faster in the older age groups, physical maturity (as represented by age) did not, in general, significantly affect the speed with which the individual judged the flight of the moving object in space.

Stimulus Characteristics of the Moving Object. Stimulus characteristics of the moving object included speed, horizontal direction and vertical direction of object flight. As indicated in Table 12, the Speed of object projection significantly affected the rapidity with which the perceptual judgment was made. Objects traveling at a faster rate of speed (49 feet/second) were responded to significantly more quickly (.403 seconds) than were objects moving at a slower rate of speed (.469 seconds). See Figure 12, p. 73.

The main effect of Horizontal Direction was also significant. Figure 12 indicates that, in general, individuals reacted significantly more quickly

FIGURE 12. SPEED OF VISUO-PERCEPTUAL RESPONSES ACCORDING TO GROUP AND STIMULUS CHARACTERISTICS (REACTION TIME)



* Significant at .01

to objects moving to the right (horizontal angle - 5^{o}) than to objects moving either to the left (5^{o}) or directly at them (horizontal angle - 0^{o}). See Table 13 for results of Scheffe's Multiple Comparison's Test.

The Vertical Direction of object flight had no significant effect upon the speed of the perceptual response to the moving object in space.

TABLE 13. SPEED OF THE PERCEPTUAL JUDGMENT: COMPARISON OF MEANS (REACTION TIME)*

HORIZONTAL DIRECTION		
RIGHT	CENTER	LEFT
.368	.445	.496

*Since all possible mean comparisons were not made, lines connect only those means which were compared. Solid lines indicate significance; broken lines indicate no significance.

ACCURACY OF THE VISUO-PERCEPTUAL JUDGMENT

Distance Deviation. The results of the analysis of distance deviations or depth errors made by the subject in judging the flight of the moving object are shown in Table 14, p. 75.

Group Characteristics. As can be seen in Table 14, the main effect of skill was significant. Figure 13, p. 77 shows clearly that skilled individuals were more than twice as accurate as unskilled individuals in judging the flight of the moving object in space.

The main effect of age was not significant. (See Table 14) Again the age of the individual apparently had no effect upon the accuracy of his

TABLE 14 . SUMMARY TABLE: ANALYSIS OF VARIANCE - DISTANCE DEVIATION

Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
Group Characteristics (Between Subjects)					
Age	74,571.43	2	37,285.71	1.91	5.08
Skill (Sk)	1,026,309.70	1	1,026,309.70	52.52*	7.19
Age X Sk	96,326.15	2	48,163.08	2.46	5.08
Subjects Within Groups	938,014.74	48	19,541.97		
Flight Characteristics (Within Subjects)					
Speed (Sp)	.141	1	.141	-	7.19
Age X Sp	34,294.04	2	17,147.02	.41	5.08
Sk X Sp	9,787.26	1	9,787.26	.23	7.19
Age X Sk X Sp	21,269.94	2	10,634.97	.25	5.08
Sp X Subjects Within Groups	2,006,798.70	48	41,808.31		
Horizontal Direction	20,545.38	2	10,272.69	7.11*	4.82
Age X HD	3,225.62	4	806.40	.56	3.51
Sk X HD	10,243.46	2	5,121.73	3.55	4.82
Age X Sk X HD	2,995.45	4	748.86	.52	3.51
HD X Subjects Within Groups	138,624.72	96	1,444.01		
Vertical Direction	43,803.00	1	43,803.00	7.63*	7.19
Age X VD	3,847.14	2	1,923.57	.34	5.08
Sk X VD	5,046.92	1	5,046.92	.88	7.19
Age X Sk X VD	4,819.73	2	2,409.86	.42	5.08
VD X Subjects Within Groups	275,505.16	48	5,739.69		
Sp X HD	26,808.80	2	13,404.40	7.48*	4.82
Age X Sp X HD	10,549.46	4	2,637.36	1.47	3.51
Sk X Sp X HD	370.80	2	185.40	.10	4.82
Age X Sk X sp X HD	3,483.43	4	870.86	.49	3.51
Sp X HD X Subjects Within Groups	171,923.59	96	1,790.87		
Sp X VD	437,196.46	1	437,196.46	126.52*	7.19
Age X Sp X VD	36,009.31	2	18,004.66	5.21*	5.08
Sk X Sp X VD	94,616.05	1	94,616.05	27.38*	7.19
Age X Sk X Sp X VD	12,942.00	2	6,471.00	1.87	5.08
Sp X VD X Subjects Within Groups	165,855.13	48	3,455.32		

TABLE 14. SUMMARY TABLE: ANALYSIS OF VARIANCE - DISTANCE DEVIATION (CONT'D)

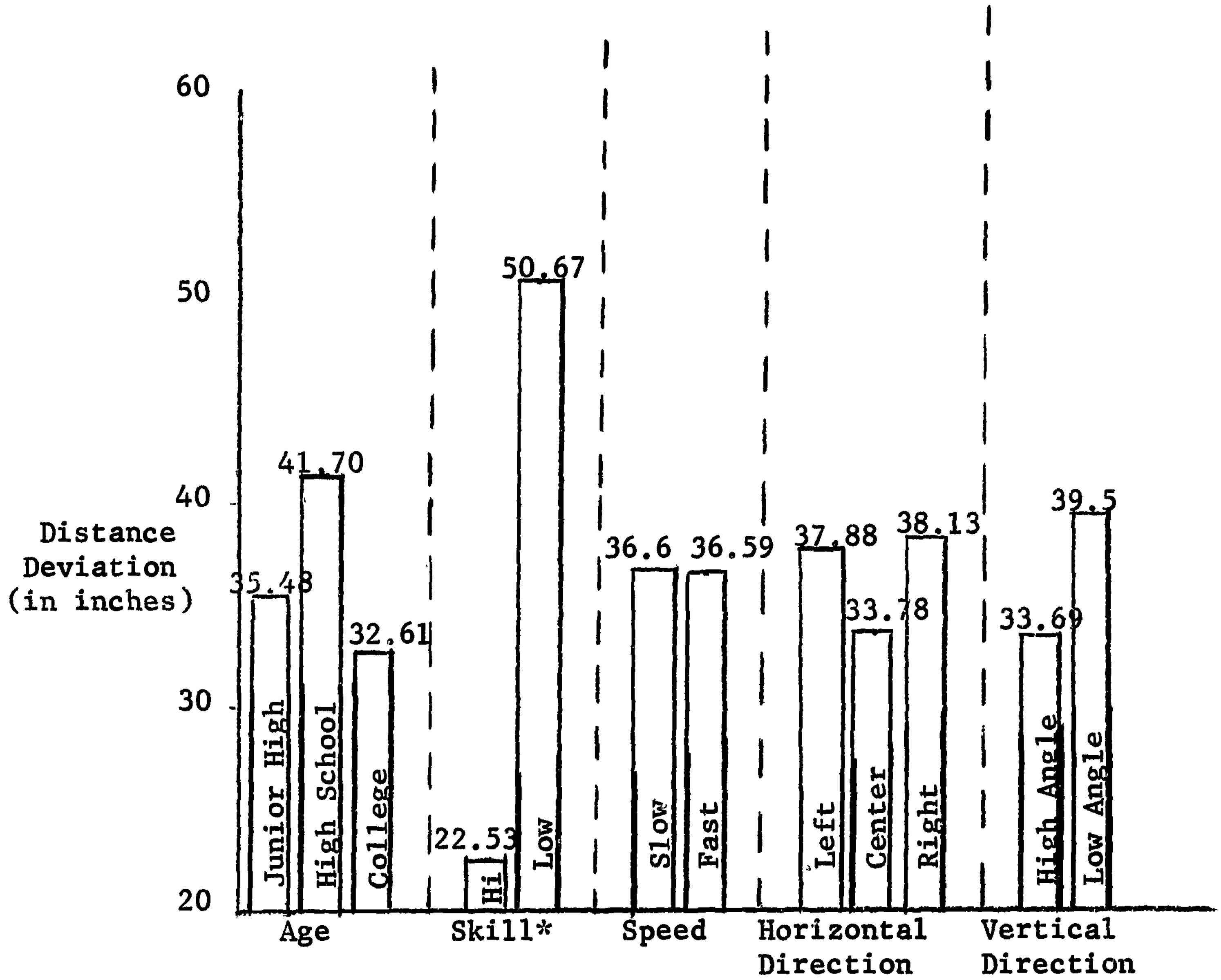
Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
HD X VD	38,955.47	2	19,477.74	15.02*	4.82
Age X HD X VD	2,419.30	4	604.82	.47	3.51
Sk X HD X VD	1,777.74	2	888.87	.685	4.82
Sk X Age X HD X VD	1,447.43	4	361.86	.279	3.51
HD X VD Subjects Within Groups	124,481.26	96	1,296.68		
Sp X HD X VD	4,577.75	2	2,288.88	2.17	4.82
Age X Sp X HD X VD	184.25	4	46.06	.04	3.51
Sk X Sp X HD X VD	2,866.23	2	1,433.11	1.36	4.82
Age X Sk X Sp X HD X VD	8,970.09	4	2,242.52	2.13	3.51
Sp X HD X VD X Subjects Within Groups	101,149.76	96	1,053.64		

*Significant at the .01 level.

visuo-perceptual response. A significant interaction between Age X Speed X Vertical Direction of object flight indicated, however, that the age of the individual may have become important when particular combinations of speed and vertical direction of object flight were being judged. The nature of this interaction is shown in Figure 14, p. 78. A comparison of group means (Table 15, p. 79) indicated that there was a significant difference between high school and college age males in accurately judging the flight of an object projected at a slow speed and a low vertical angle (34°). It should be pointed out that the exact nature of this interaction was not clear and thus no strict interpretation or evaluation of such effects can be made on the basis of the present data.

<u>Stimulus Characteristics of the Moving Object</u>. Table 14 indicates that both Horizontal and Vertical Direction of object flight significantly affected the accuracy of the perceptual judgment made by the performer. In terms of horizontal direction, objects moving directly toward the individual (horizontal angle - 0°; 33.78") were judged significantly more accurately than were

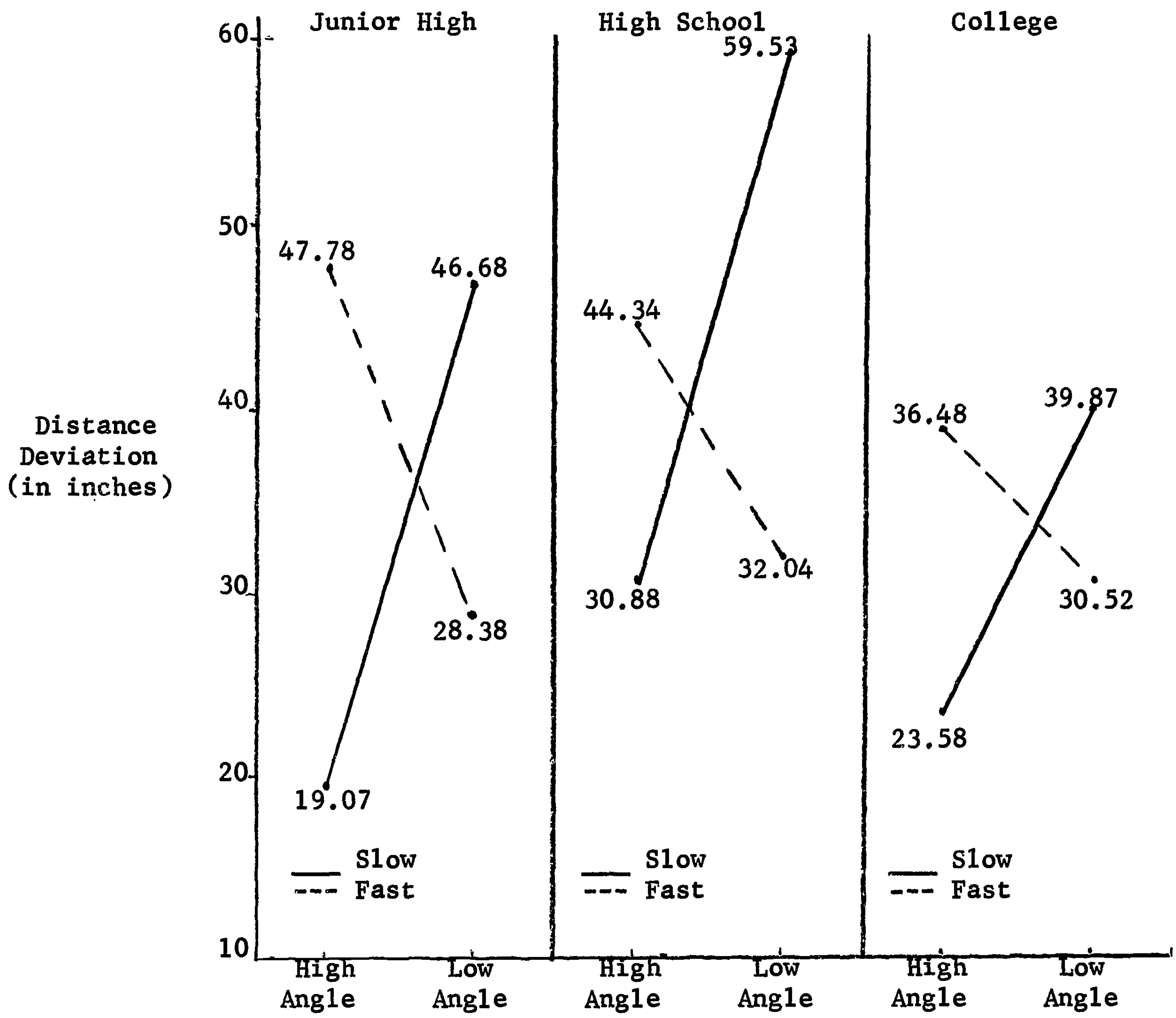
FIGURE 13. ACCURACY OF THE VISUO-PERCEPTUAL JUDGMENTS ACCORDING TO GROUP AND STIMULUS CHARACTERISTICS: DISTANCE DEVIATION



* Significant at .01

those moving to either the right (38.13") or the left (37.88") of the individual. (Figure 13, Table 16, p. 82) With respect to vertical direction of object flight, objects projected at a sharper vertical angle (44°) were judged more accurately (33.69") than those projected at a flatter vertical angle (34°; 39.5"). A significant interaction between Horizontal X Vertical Direction of object flight indicated that specific combinations of these two stimulus characteristics affected the individual's judgment of the flight of the moving object in different ways. Figure 15, p. 79, indicates that an object projected at a vertical angle of 34° was judged equally precisely regardless of the horizontal direction in which it

FIGURE 14 . INTERACTION EFFECT: AGE X SPEED X VERTICAL DIRECTION (DISTANCE DEVIATION IN INCHES)



was moving. Objects projected at a vertical angle of 44°, however, were affected by the horizontal direction of object flight and were judged most accurately when the object was moving directly toward the individual. See Figure 15, p.79.

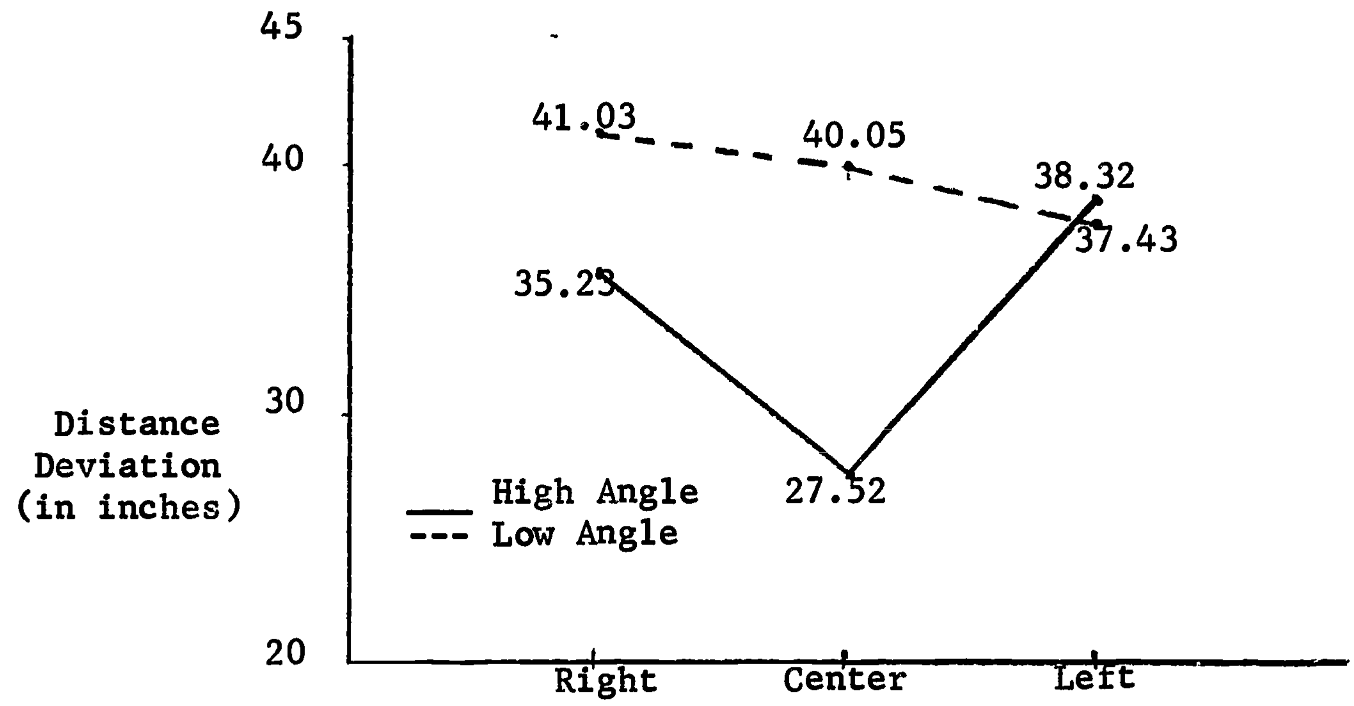
The main effect of speed was not significant, that is, perceptual judgments of objects moving at a fast rate of speed were as accurate as those

TABLE 15. SPATIAL ACCUARACY OF THE VISUO-PERCEPTUAL JUDGMENT: COMPARISON OF MEANS (DISTANCE DEVIATION)*

AGE X SPEED X VERTICAL DIRECTION		
JR-SLO-44° 19.07"	HI SCH-SLO-44° 30.88"	COLL-SLO-44° 23.58"
JR-SLO-34° 46.68"	HI SCH-SLO-34° 59.53"	COLL-SLO-34° 39.87"
JR-FAST-44° 47.78"	HI SCH-FAST-44° 44.84"	COLL-FAST-44° 36.48"
JR-FAST-34° 28.38"	HI SCH-FAST-34° 32.04"	COLL-FAST-34° 30.52"

*Since all possible mean comparisons were not made, lines connect only those means which were compared. Solid lines indicate significance; broken lines indicate no significance.

FIGURE 15. INTERACTION EFFECT: HORIZONTAL X VERTICAL DIRECTION (DISTANCE DEVIATION IN INCHES)



perceptual judgments of objects moving at a slow rate of speed. See Table 14, p. 75. The significant interaction between Speed X Vertical Direction (Figure 16, p. 81) and Speed X Horizontal Direction (Figure 17, p. 81) of object flight indicated that speed, when combined with a given vertical or horizontal direction of object flight, did in fact affect the accuracy of the visuo-perceptual judgment. For example, speed was not important when objects were projected at a horizontal angle of 5°-right or at a horizontal angle of 0°. (See Table 16, p. 82.) Conversely, visuo-perceptual judgments of objects moving horizontally to the left were significantly more accurate when the object was moving at a slow speed than when it was traveling at a fast speed.

In addition, the interaction between Speed X Vertical Direction, shown in Figure 16, indicated that objects projected at a greater vertical angle (44°) were judged more accurately when they were traveling at a slow speed, while those projected at a flatter vertical angle (34°) were judged more accurately when they were traveling at a fast speed. The significant interaction between Skill X Speed X Vertical Direction further suggested that the nature of the effect of speed and vertical direction upon the visuo-perceptual response was also dependent upon the skill level of the individual. See Figure 18, p. 83. When objects were moving at a slow speed, the effect of vertical direction of object flight was the same for both groups. (The skilled were, of course, always more accurate than the unskilled.) When the object was moving at a fast speed, the effect of the vertical direction of object flight depended upon the level of skill of the individual making the response. For the skilled person, the vertical direction of object flight had little or no effect upon the accuracy of the visuo-perceptual judgment. For the unskilled person, however, objects projected at a vertical angle of 34° were judged significantly more accurately than were those projected at a vertical angle of 44°. (See Table 16.)

FIGURE 16. INTERACTION EFFECT: SPEED X VERTICAL DIRECTION (DISTANCE DEVIATION IN INCHES)

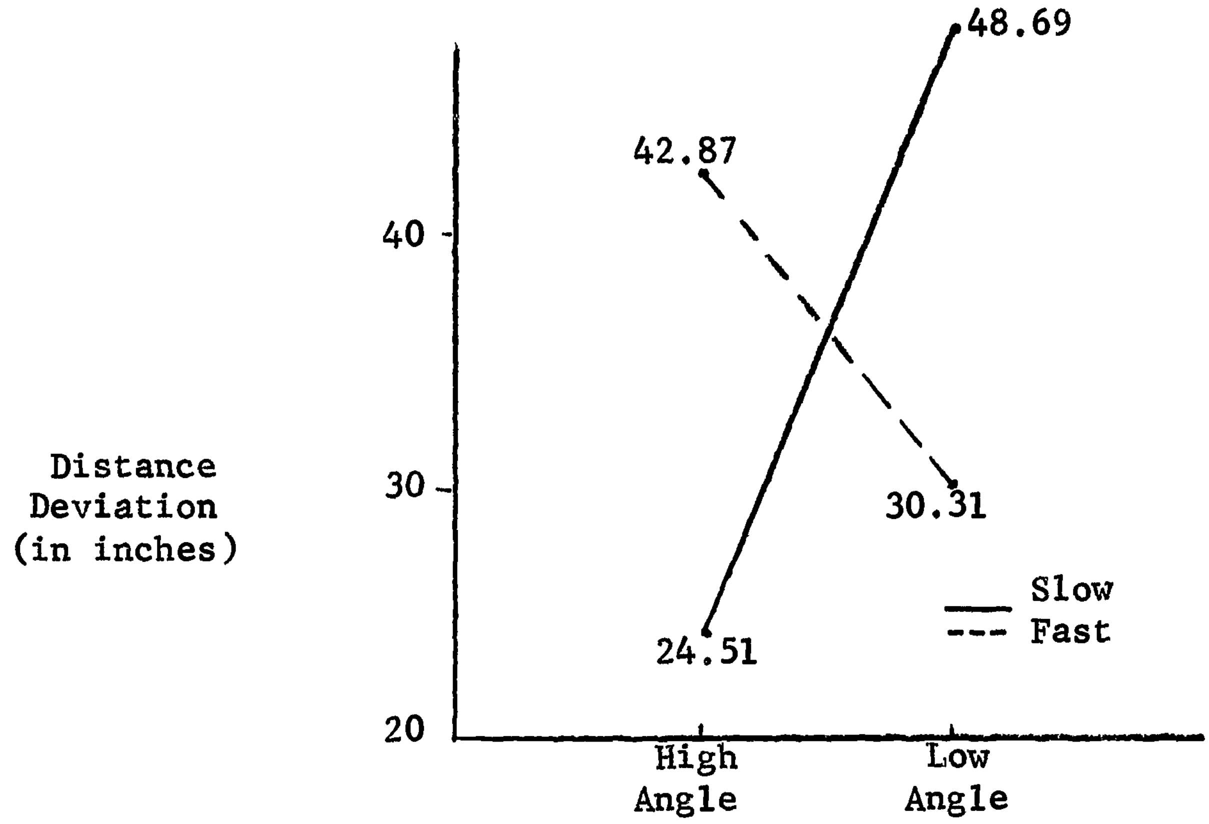


FIGURE 17. INTERACTION EFFECT: SPEED X HORIZONTAL DIRECTION (DISTANCE DEVIATION IN INCHES)

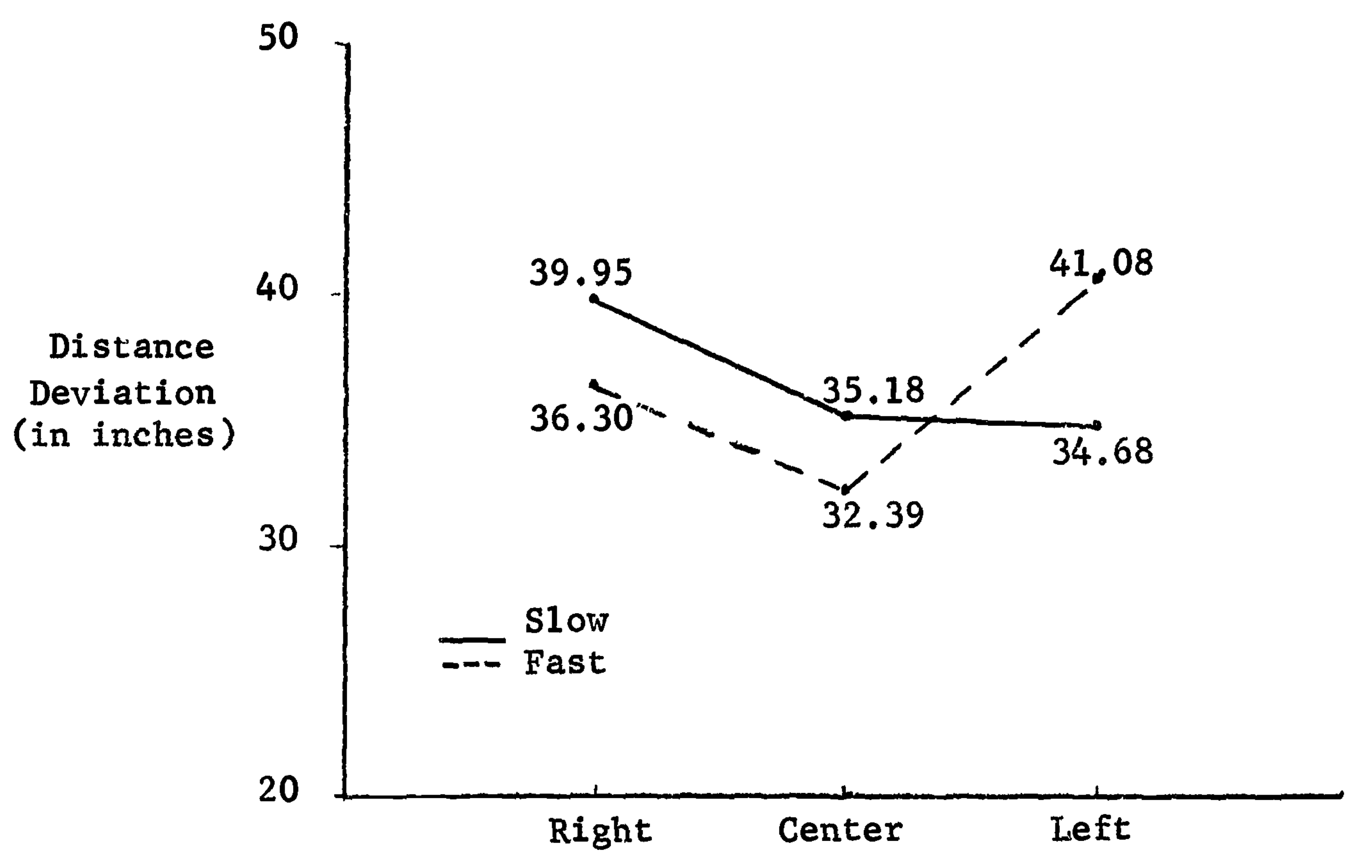


TABLE 16. SPATIAL ACCURACY OF THE VISUO-PERCEPTUAL JUDGMENT: COMPARISON OF MEANS (DISTANCE DEVIATION)*

HORIZONTAL DIRECTION		
RIGHT	CENTER	LEFT
38.13"	33.78"	37.88"

HORIZONTAL X VERTICAL DIRECTION					
RT-44°	CTR-44°	LFT-44°	RT-34°	CTR-34°	LFT-34°
35.23"	27.52"	38.32"	41.03"	40.05"	37.43"

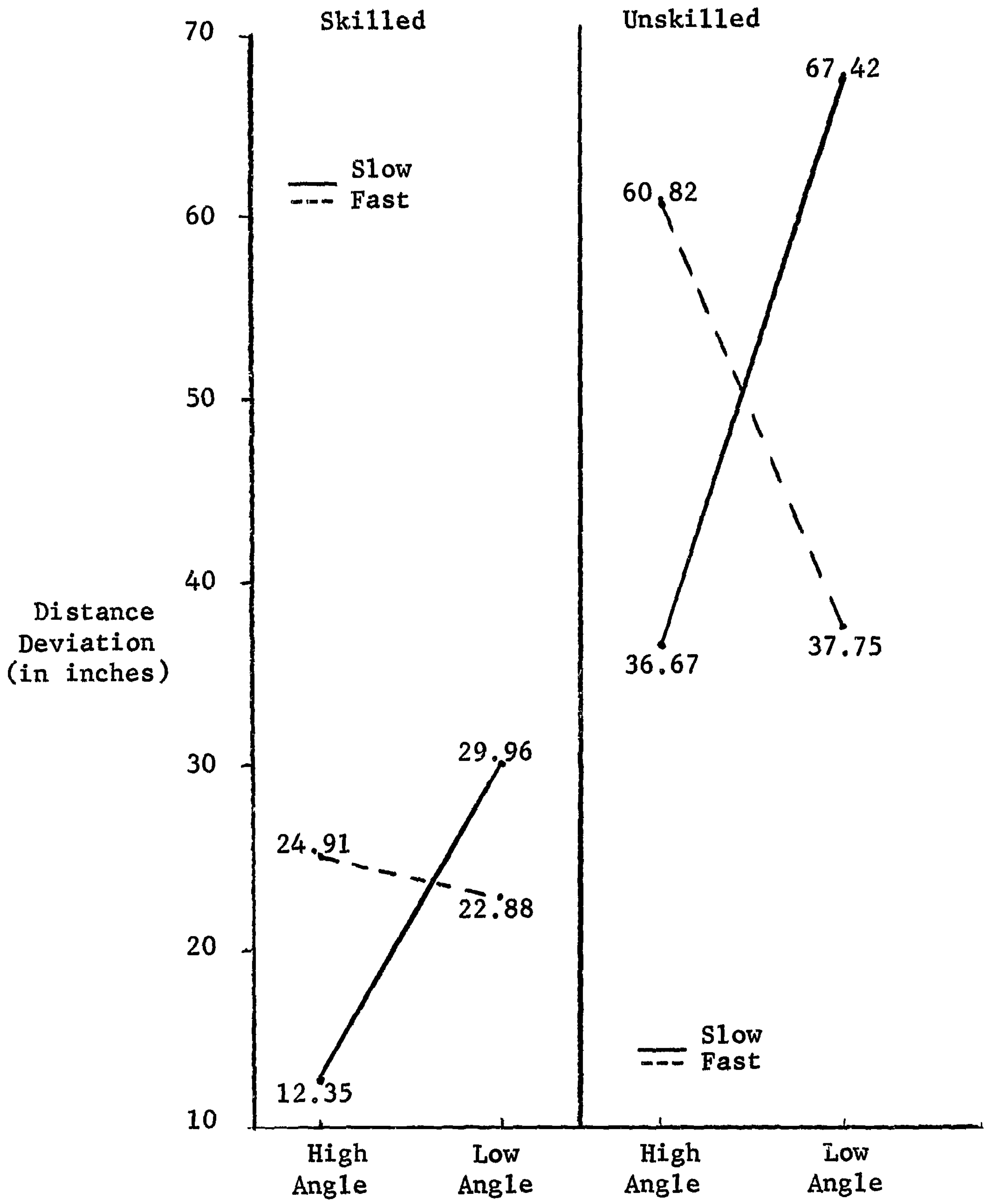
SPEED X HORIZONTAL DIRECTION					
FST-RT	FST-CTR	FST-LFT	SLO-RT	SLO-CTR	SLO-LFT
36.30"	32.39"	41.08"	39.95"	35.18"	34.68"

SPEED X VERTICAL DIRECTION			
FST-44°	FST-34°	SLO-44°	SLO-34°
42.87"	30.31"	24.51"	48.69"

SKILL X SPEED X VERTICAL DIRECTION			
HI-SLO-44°	HI-SLO-34°	HI-FST-44°	HI-FAST-34°
12.35"	29.96"	24.91"	22.88"
LO-SLO-44°	LO-SLO-34°	LO-FST-44°	LO-FAST-34°
36.67"	67.42"	60.82"	37.75"

*Since all possible mean comparisons were not made, lines connect only those means which were compared. Solid lines indicate significance; broken lines indicate no significance.

FIGURE 18. INTERACTION EFFECT: SKILL X SPEED X VERTICAL DIRECTION (DISTANCE DEVIATION IN INCHES)



Radial Error. The results of the analysis of radial error are shown in Table 17, p. 85.

Group Characteristics. Figure 19, p. 87 shows the effect of skill level upon the accuracy of the perceptual judgment in terms of radial or absolute error. Skilled individuals were significantly more accurate than unskilled individuals in judging the flight of the moving object in space. The main effect of age, however, was not significant. Thus for the particular age groups involved in this study, the level of physical maturity of the individual was not an important factor affecting the accuracy of the visuo-perceptual judgment.

Stimulus Attributes of the Moving Object. Stimulus characteristics of the moving object included speed, horizontal direction, and vertical direction of object flight. The main effects of horizontal and vertical direction were significant. (See Table 17, p. 85) In general, objects projected directly at the individual (a horizontal angle of 0°; 36.75") were judged significantly more accurately than those projected to his left (42.39") or right (40.43"; horizontal angle - 5°). (See Table 18, p. 89) For the vertical direction of object flight, objects projected at a greater vertical angle (44° above the horizontal) were judged more accurately than those projected at a flatter vertical angle (34° above the horizontal). The interaction between Horizontal Direction X Vertical Direction was also significant. This suggested that the accuracy of the visuo-perceptual response was dependent upon the particular combination of horizontal and vertical direction of object flight being judged. The nature of this interaction effect is shown in Figure 20, p. 88. As can be seen, objects projected at a flatter vertical angle (34°) were judged equally accurately regardless of the horizontal direction of their flight. Judgments about objects projected at a greater vertical angle (44°), however, were affected differentially by the horizontal direction in which the object was traveling. When the object was projected

TABLE 17. SUMMARY TABLE: ANALYSIS OF VARIANCE - RADIAL ERROR

Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
Group Characteristics (Between Subjects)					
Age	70,029.30	2	35,014.65	2.31	5.08
Skill (Sk)	1,017,268.36	1	1,017,268.36	67.14*	7.19
Age X Skill	80,166.22	2	40,083.11	2.65	5.08
Subjects Within Groups	727,296.48	48	15,152.01		
Flight Characteristics (Within Subjects)					
Speed (Sp)	16,594.45	1	16,594.45	.47	7.19
Age X Speed	33,763.04	2	16,881.52	.48	5.08
Sk X Sp	10,271.26	1	10,271.26	.29	7.19
Age X Sk X Sp	20,264.79	2	10,132.40	.29	5.08
Sp X Subjects Within Groups	1,696,971.02	48	35,353.56		
Horizontal Direction (HD)	28,322.17	2	14,161.08	8.04*	4.82
Age X HD	7,824.79	4	1,956.27	1.11	3.51
Sk X HD	9,572.44	2	4,786.22	2.72	4.82
Age X Sk X HD	929.94	4	232.48	.13	3.51
HD X Subjects Within Groups	169,129.12	96	1,761.76		
Vertical Direction (VD)	53,085.44	1	53,085.44	8.44*	7.19
Age X VD	5,095.41	2	2,547.71	.40	5.08
Sk X VD	2,616.61	1	2,616.61	.42	7.19
Age X Sk X VD	6,134.60	2	3,067.30	.49	5.08
VD X Subjects Within Groups	302,073.37	48	6,293.20		
Sp X HD	69,104.35	2	34,552.18	12.23*	4.82
Age X Sp X HD	13,363.94	4	3,340.99	1.18	3.51
Sk X Sp X HD	1,125.34	2	562.67	.199	4.82
Age X Sk X Sp X HD	1,979.54	4	494.88	.175	3.51
Sp X HD Subjects Within Groups	271,134.12	96	2,824.31		
Sp X VD	339,549.00	1	339,549.00	84.69*	7.19
Age X Sp X VD	25,941.81	2	12,970.91	3.24	5.08
Sk X Sp X VD	78,672.46	1	78,672.46	19.62*	7.19
Age X Sk X Sp X VD	19,341.12	2	9,670.56	2.41	5.08
Sp X VD Subjects Within Groups	192,440.20	48	4,009.17		

TABLE 17. SUMMARY TABLE: ANALYSIS OF VARIANCE - RADIAL ERROR (CONT'D)

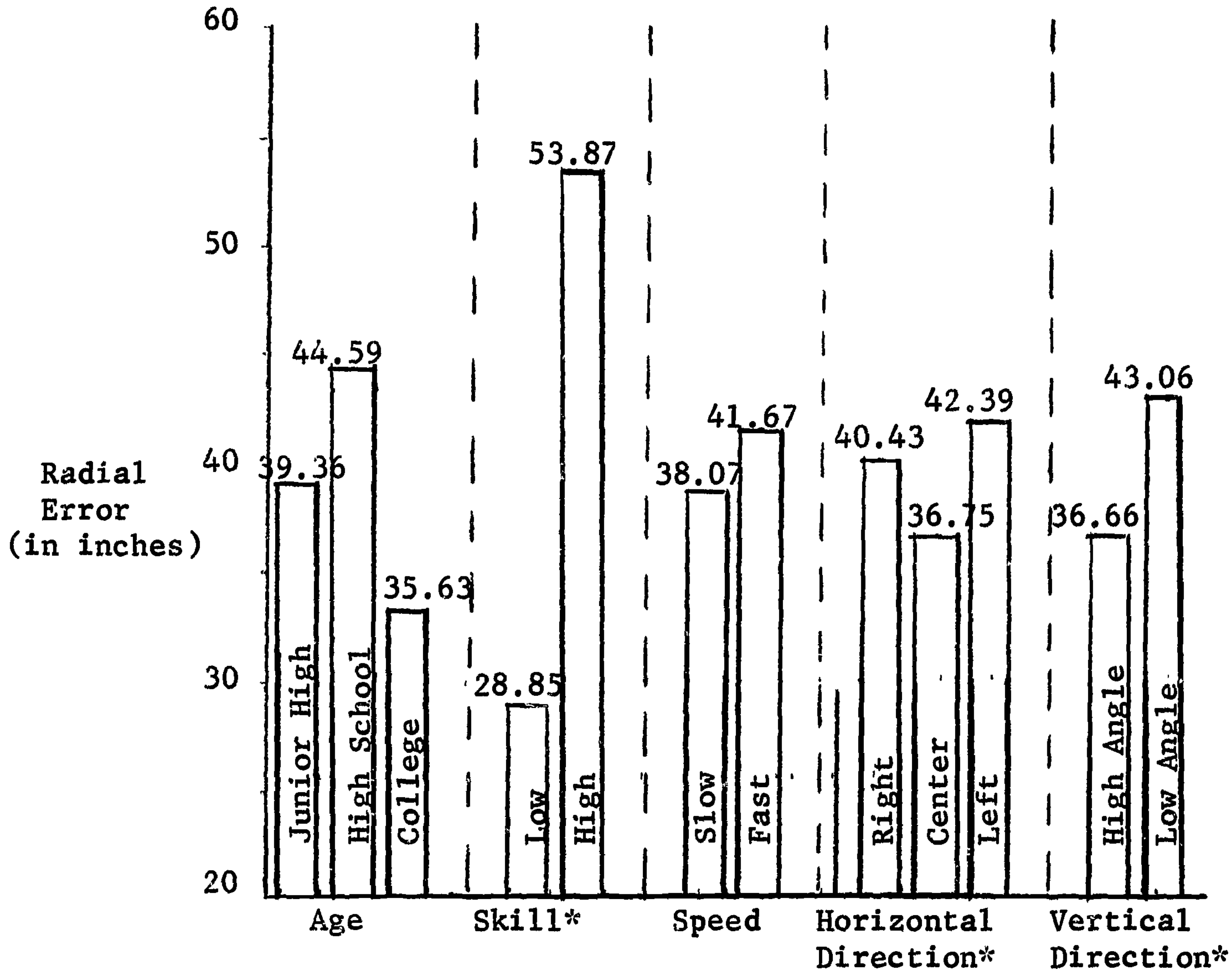
Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
HD X VD	20,889.36	2	10,444.68	5.04*	4.82
Age X HD X VD	2,175.77	4	543.77	.26	3.51
Sk X HD X VD	1,250.05	2	625.02	.30	4.82
Age X Sk X HD X VD	546.97	4	136.74	.07	3.51
HD X VD Subjects Within Groups	199,001.85	96	2,072.94		
Sp X HD X VD	678.63	2	343.81	.18	4.82
Age X Sp X HD X VD	1,249.58	4	312.39	.17	3.51
Sk X Sp X HD X VD	2,981.34	2	1,490.67	.79	4.82
Age X Sk X Sp X HD X VD	5,801.96	4	1,450.49	.77	3.51
Sp X HD X VD Subjects Within Groups	180,429.62	96	1,879.48		

*Significant at the .01 level.

directly toward the individual, it was judged more accurately than when it was projected to either the right or the left of the individual.

The main effect of speed was not significant suggesting that in general the speed of object flight (within the limits of the speeds used) did not significantly affect the accuracy of the visuo-perceptual judgment made by the individual. Significant interactions between Speed X Horizontal Direction and Speed X Vertical Direction indicated that speed did become important when the speed characteristics of object flight were combined with a particular directional component of object flight. (See Table 18, p. 89) These interactions are shown in Figures 21 and 22, p. 90. Figure 21 suggests that when the object was projected to the right of or directly at the individual, speed had little or no effect upon the visuo-perceptual response. However, when the object was moving to the left of the individual, speed became important and objects traveling at a slower speed were judged significantly more accurately than those moving at a faster rate of speed.

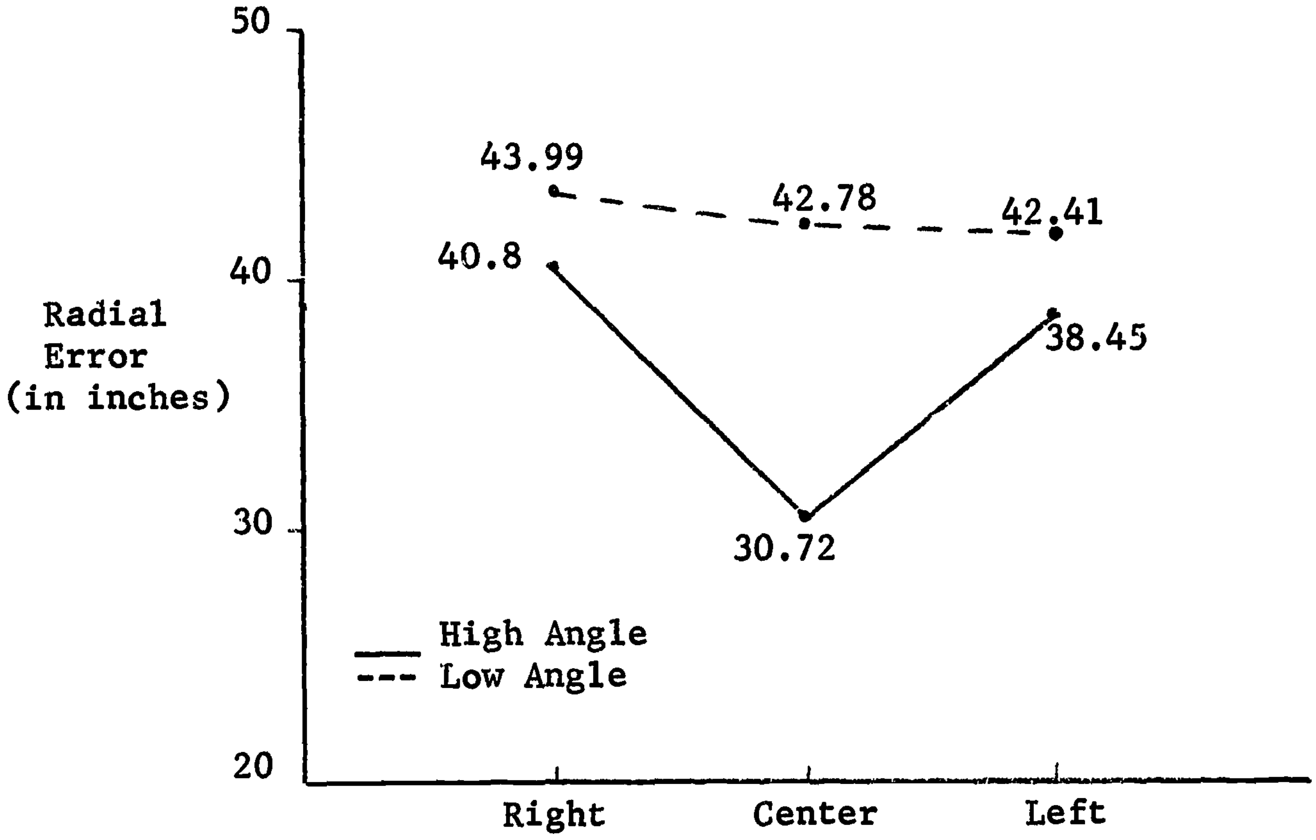
FIGURE 19. ACCURACY OF VISUO-PERCEPTUAL JUDGMENTS AS A FUNCTION OF GROUP CHARACTERISTICS AND STIMULUS ATTRIBUTES OF THE MOVING OBJECT IN SPACE (RADIAL ERROR)



* Significant at .01

In terms of vertical direction, objects projected at a low vertical angle were more difficult to judge when they were traveling at a slow rate of speed. See Figure 22. Conversely, objects projected at a higher vertical angle were more difficult to judge when they were traveling at a fast rate of speed. In addition, the interaction between Skill X Speed X Vertical Direction (See Table 18, p. 89 and Figure 23, p. 91) indicated that visuo-

FIGURE 20. INTERACTION EFFECT: VERTICAL X HORIZONTAL DIRECTION (RADIAL ERROR IN INCHES)



perceptual judgments about objects moving at a given speed and in a given vertical direction were also affected to some degree by the particular skill level of the individual making the judgment. Although difficult to interpret, this interaction effect appeared to involve differences in the accuracy of the visuo-perceptual response when the object was projected at a <u>fast</u> speed. The skilled person judged fast-moving objects equally accurately whether they were projected at a high or low vertical angle. For the unskilled person, objects projected at a fast speed and high vertical angle were significantly more difficult to judge than were objects projected at a fast speed and low vertical angle.

TABLE 18. SPATIAL ACCURACY OF THE VISUO-PERCEPTUAL JUDGMENT: COMPARISON OF MEANS (RADIAL ERROR)*

HORIZONTAL DIRECTION

RIGHT	CENTER	LEFT
40.43"	36.75"	42.39"

HORIZONTAL X VERTICAL DIRECTION

RT-44°	CTR-44°	LFT-44°	RT-34°	CTR-34°	LFT-34°
40.80"	30.72"	38.45"	43.99"	42.78"	42.41"

SPEED X HORIZONTAL DIRECTION

FST-RT	FST-CTR	FST-LFT	SLO-RT	SLO-CTR	SLO-LFT
38.65"	37.09"	49.20"	42.20"	36.42"	35.59"

SPEED X VERTICAL DIRECTION

FST-44°	FST-34°	SLO-44°	SLO-34°
46.54"	36.75"	26.78"	49.36"

SKILL X SPEED X VERTICAL DIRECTION

HI-SLO-44°	HI-SLO-34°	HI-FST-44°	HI-FST-34°
14.55"	30.76"	29.33"	28.76"
LO-SLO-44°	LO-SLO-34°	LO-FST-44°	LO-FST-34°
39.01"	67.96"	63.75"	44.75"

*Since all possible mean comparisons were not made, lines connect only those means which were compared. Solid lines indicate significance; broken lines indicate no significance.

FIGURE 21 . INTERACTION EFFECT: SPEED X HORIZONTAL DIRECTION
(RADIAL ERROR IN INCHES)

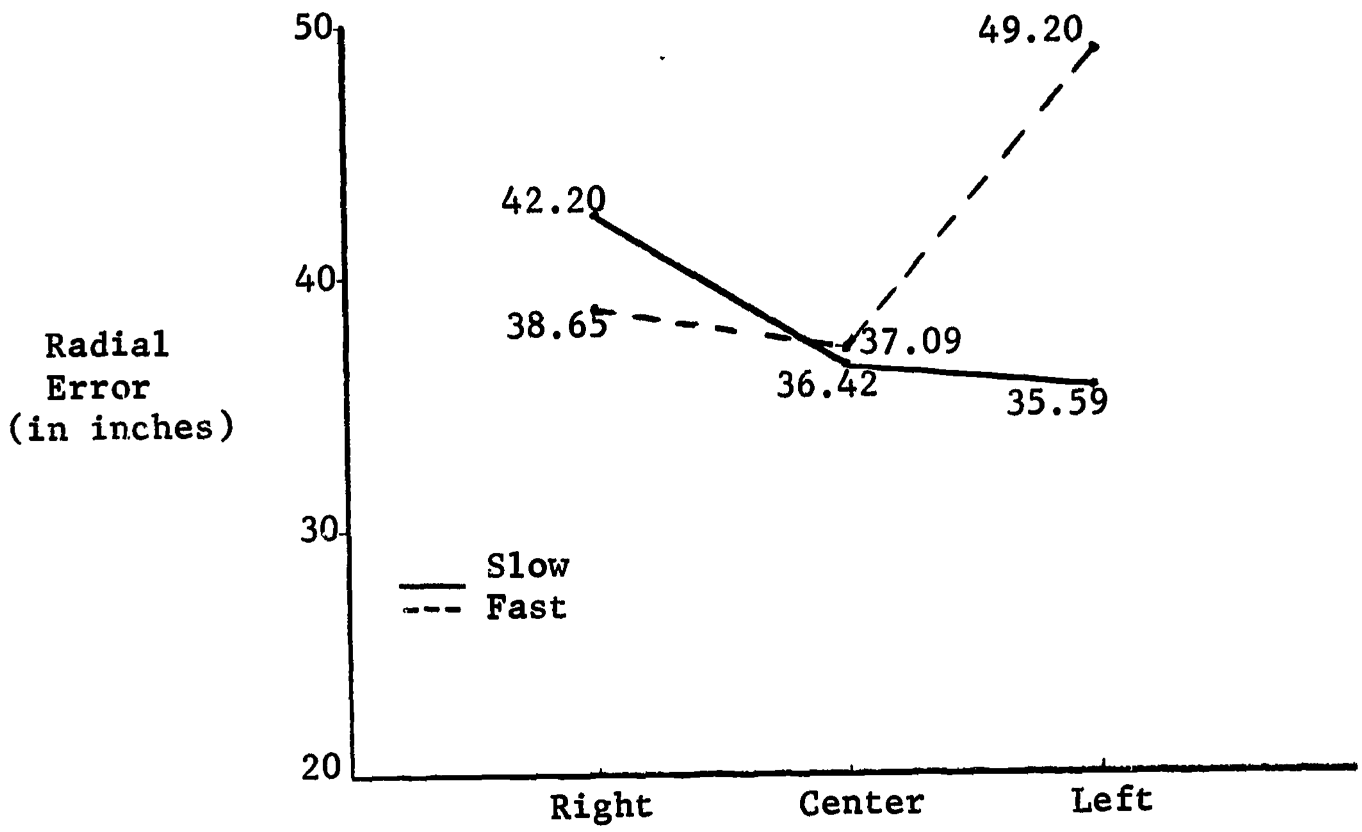


FIGURE 22 . INTERACTION EFFECT: SPEED X VERTICAL DIRECTION
(RADIAL ERROR IN INCHES)

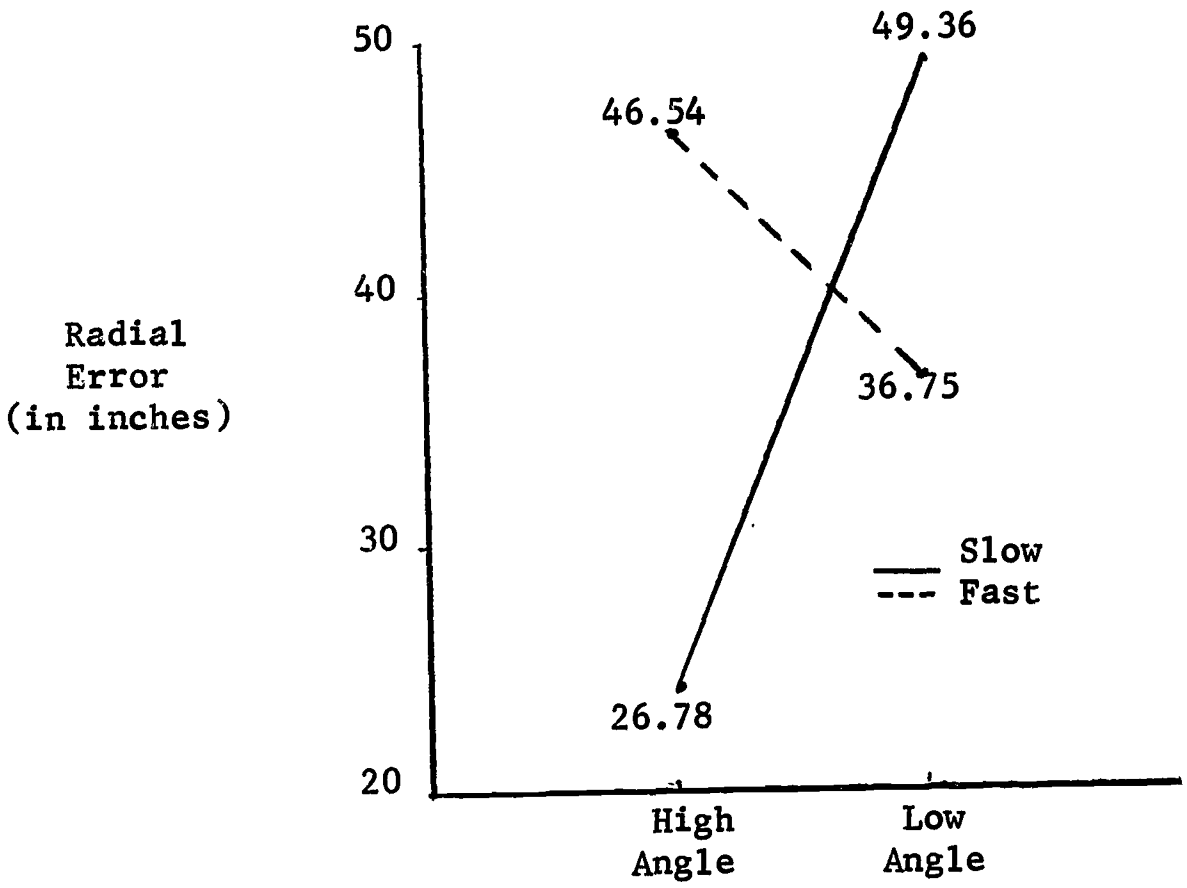
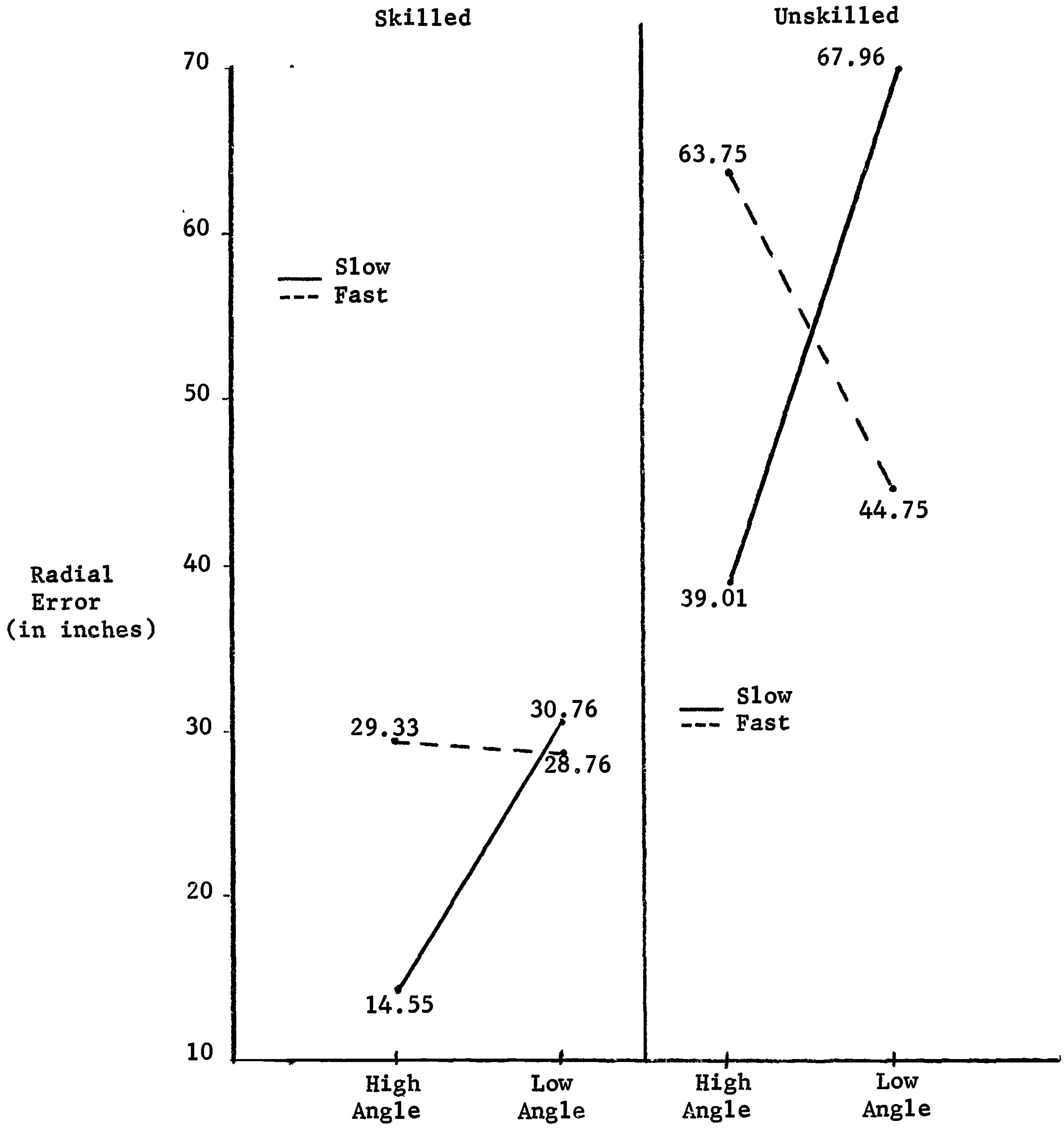


FIGURE 23. INTERACTION EFFECT: SPEED X SKILL X VERTICAL DIRECTION (RADIAL ERROR IN INCHES)



Lateral Deviation. The results of the analysis of lateral deviations or right-left errors made by the individual in judging the flight of the moving object are shown in Table 19, p. 93. (Interpretation of the results of the analysis are made in light of the low reliabilities obtained for this performance measure.)

Group Characteristics. Table 19 indicates that the level of skill of the individual significantly affected the accuracy of his visuo-perceptual response. In terms of right-left error, then, skilled individuals (6.35") judged the flight of the moving object significantly more accurately than did unskilled individuals (8.04"). (See Figure 24, p. 94.)

The age or maturity level of the individual did not significantly affect the precision of the visuo-perceptual judgment. The presence of two significant higher order interactions involving Age X Horizontal Direction (Figure 25, p. 95) and Age X Speed X Horizontal Direction (Figure 26, p. 96) indicated that age may have become an important factor affecting the visuo-perceptual judgment when certain specific combinations of stimulus characteristics were being judged by the individual. However, the exact nature and meaning of these interactions was difficult to establish. Therefore, no strict interpretation of these particular effects was possible.

Stimulus Characteristics of the Moving Object. Each of the three main effects of speed, horizontal direction and vertical direction of object flight were significant. (See Table 19, p. 93) The nature of these effects are shown in Figure 24, p. 94. Overall, errors in the perceptual judgment (right-left error) were greater for objects projected at the fast speed (10.49") than for those projected at the slow speed (3.90"). In terms of horizontal direction of object flight, errors in the perceptual response were greatest for objects

TABLE 19. SUMMARY TABLE: ANALYSIS OF VARIANCE - LATERAL DEVIATION

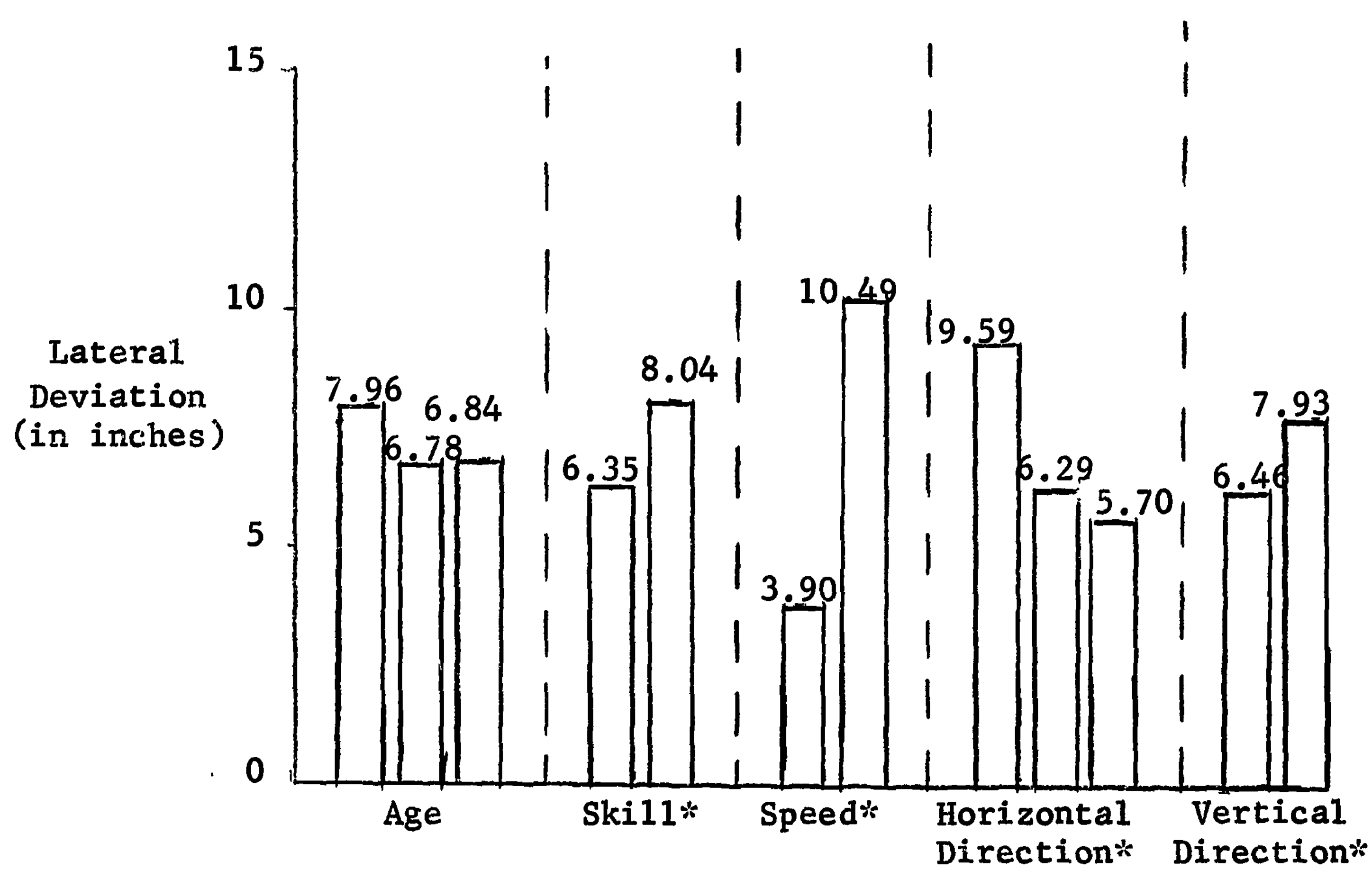
Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
Group Characteristics (Between Subjects)					
Age	1,511.30	2	755.65	1.66	5.08
Skill (Sk)	3,673.71	1	3,673.71	8.08*	7.19
Age X Sk	70.96	2	35.48	.08	5.08
Subjects Within Groups	21,823.98	48	454.67		
Flight Characteristics (Within Subjects)					
Speed (Sp)	56,116.35	1	56,116.35	158.64*	7.19
Age X Sp	556.30	2	278.15	.79	5.08
Sk X Sp	338.15	1	338.15	.96	7.19
Age X Sk X Sp	564.40	2	283.70	.80	5.08
Sp X Subjects Within Groups	16,978.99	48	353.73		
Horizontal Direction	15,176.13	2	7,588.06	17.69*	4.82
Age X HD	23,385.75	4	5,846.44	13.63*	3.51
Sk X HD	2,052.12	2	1,026.06	2.39	4.82
Age X Sk X HD	3,645.24	4	911.31	2.12	3.51
HD X Subjects Within Groups	41,190.13	96	429.06		
Vertical Direction	2,811.95	1	2,811.95	23.74	7.19
Age X VD	479.64	2	239.82	2.02	5.08
Sk X VD	836.17	1	836.17	7.06	7.19
Age X Sk X VD	329.00	2	164.50	1.39	5.08
VD X Subjects Within Groups	5,686.13	48	118.46		
Sp X HD	39,178.49	2	19,589.25	68.80*	4.82
Age X Sp X HD	8,703.99	4	2,176.00	7.64*	3.51
Sk X Sp X HD	1,425.18	2	712.59	2.50	4.82
Age X Sk X Sp X HD	2,954.31	4	738.58	2.59	3.51
Sp X HD X Subjects Within Groups	27,331.91	96	284.71		
Sp X VD	2,269.46	1	2,269.46	21.46*	7.19
Age X Sp X VD	205.42	2	102.71	.97	5.08
Sk X Sp X VD	53.37	1	53.37	.50	7.19
Age X Sk X Sp X VD	323.39	2	161.70	1.53	5.08
Sp X VD X Subjects Within Groups	11,771.06	96	122.62		

TABLE 19. SUMMARY TABLE: ANALYSIS OF VARIANCE - LATERAL DEVIATION (CONT'D)

Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
HD X VD	10,129.80	2	5,064.90	41.31*	4.82
Age X HD X VD	1,514.81	4	378.70	3.09	3.51
Sk X HD X VD	683.90	2	341.95	2.79	4.82
Sk X Age X HD X VD	724.46	4	181.12	1.48	3.51
HD X VD X Subjects Within Groups	11,771.06	96	122.62		
Sp X HD X VD	2,114.97	2	1,057.49	8.29*	4.82
Age X Sp X HD X VD	1,462.29	4	365.57	2.87	3.51
Sk X Sp X HD X VD	292.07	2	146.03	1.14	4.82
Age X Sk X Sp X HD X VD	470.78	4	117.69	.92	3.51
Sp X HD X VD X Subjects Within Groups	12,243.85	96	127.54		

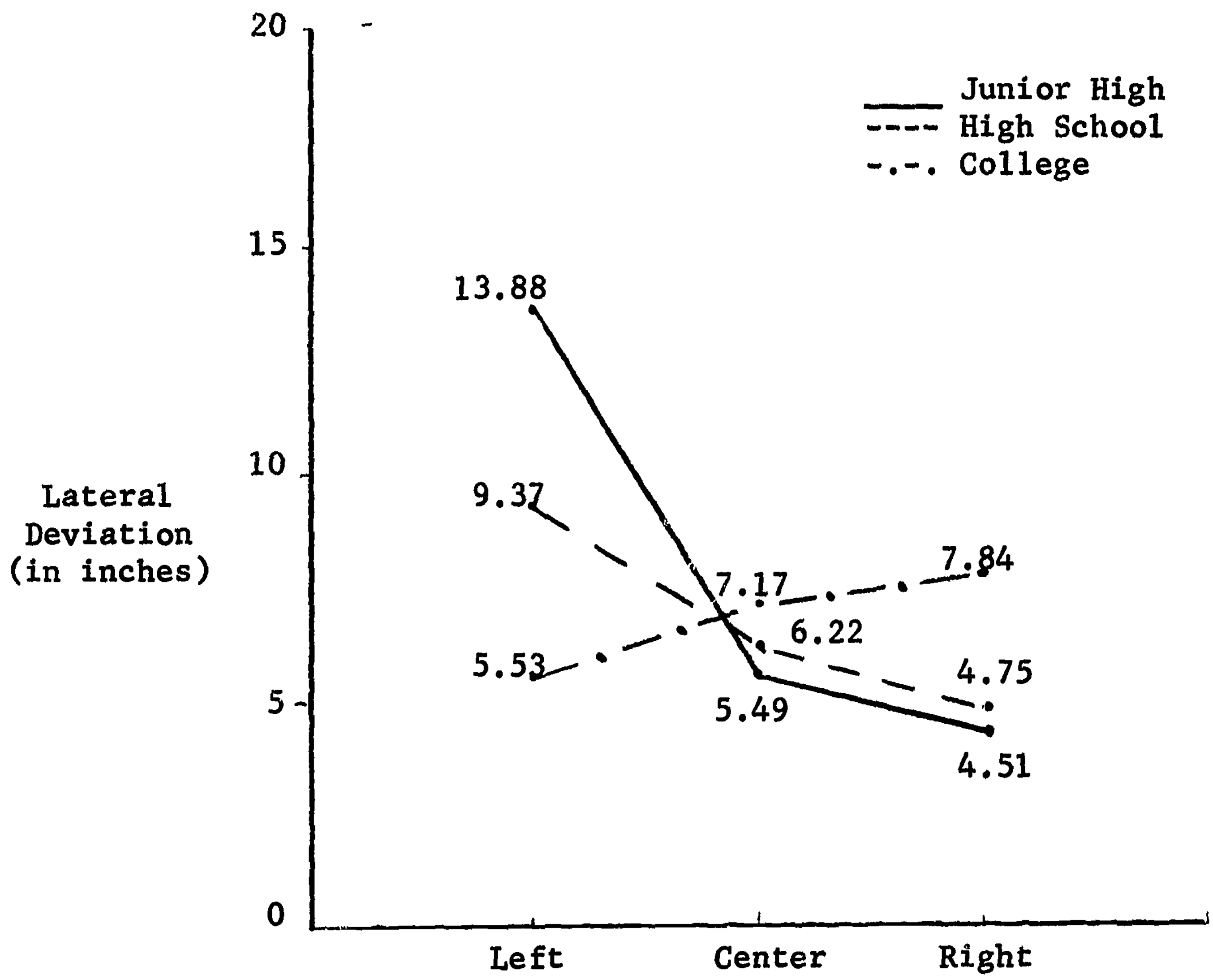
*Significant at the .01 level.

FIGURE 24. ACCURACY OF THE VISUO-PERCEPTUAL JUDGMENT ACCORDING TO GROUP AND STIMULUS CHARACTERISTICS (LATERAL DEVIATION)



*Significant at .01 level

FIGURE 25. INTERACTION EFFECT: AGE X HORIZONTAL DIRECTION (LATERAL DEVIATION IN INCHES)



projected to the <u>left</u> of the individual; for vertical direction, perceptual judgments were less accurate for objects projected at a vertical angle of 34° (7.93") than for objects projected at a vertical angle of 44° (6.46").

The following higher order interactions were also significant: Speed X Horizontal Direction (Figure 27, p.97), Speed X Vertical Direction (Figure 28, p. 97), Horizontal X Vertical Direction (Figure 29, p. 98), and Speed

FIGURE 26. INTERACTION EFFECT: AGE X SPEED X HORIZONTAL DIRECTION (LATERAL DEVIATION IN INCHES)

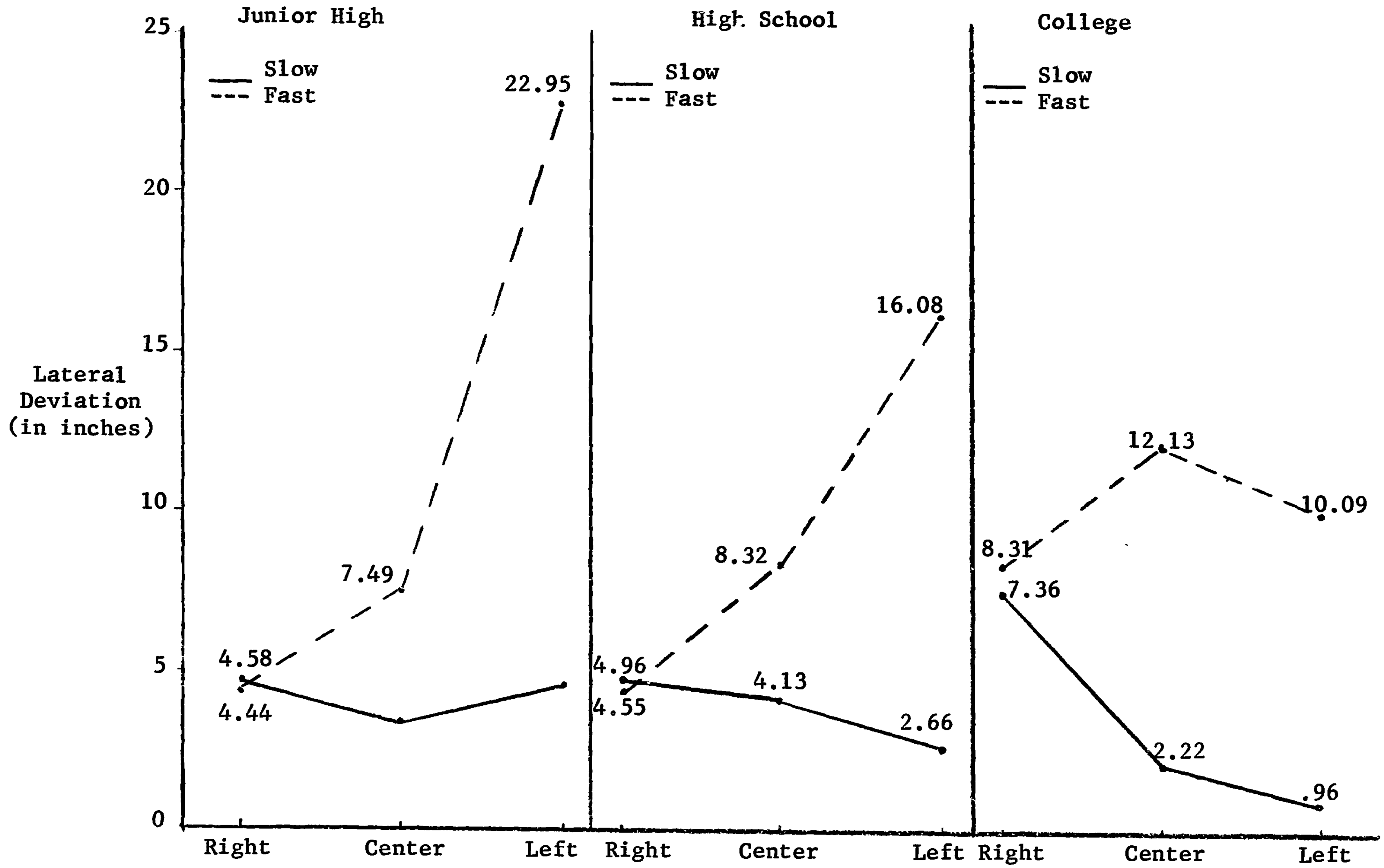


FIGURE 27. INTERACTION EFFECT: SPEED X HORIZONTAL DIRECTION
(LATERAL DEVIATION IN INCHES)

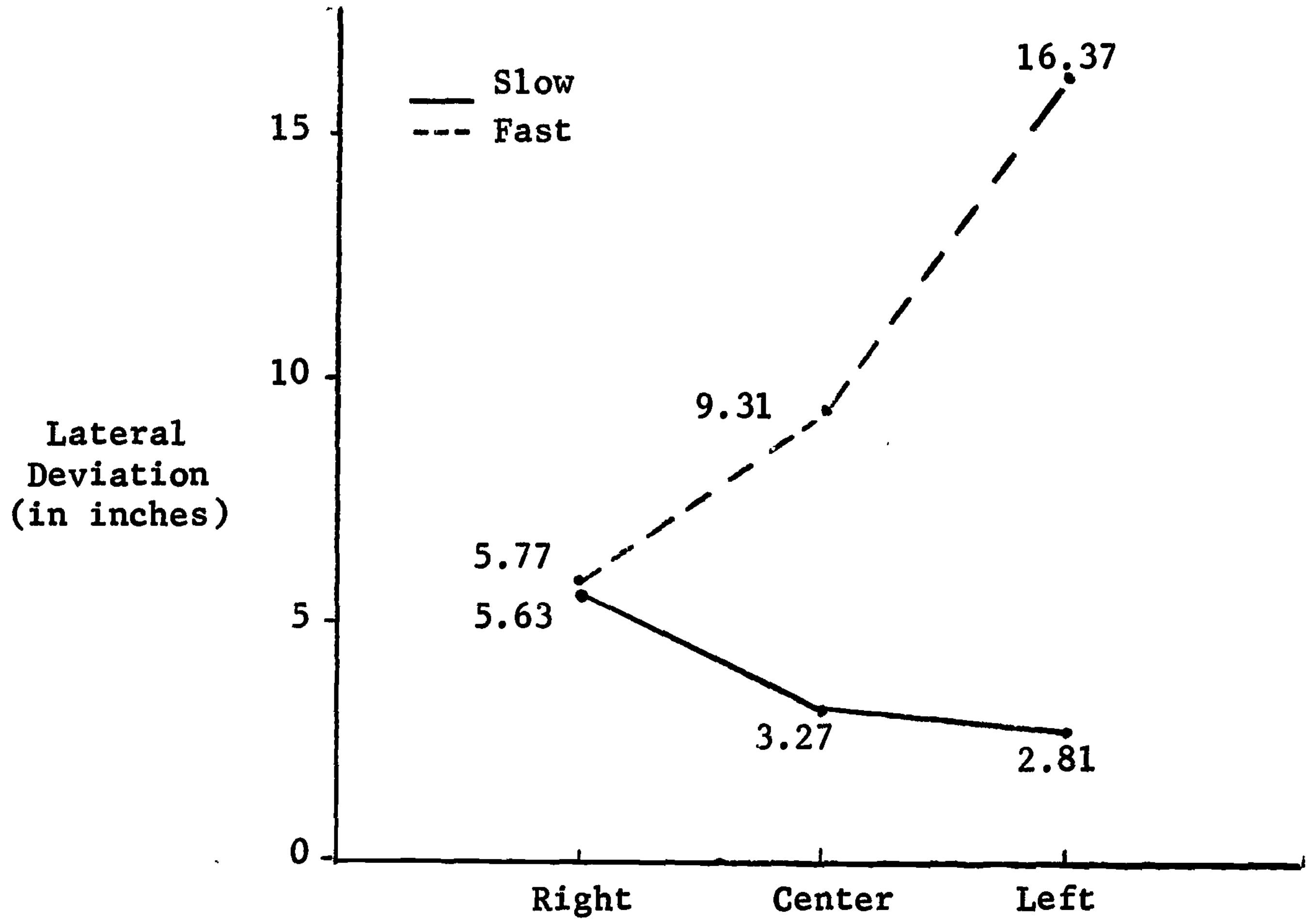


FIGURE 28. INTERACTION EFFECT: SPEED X VERTICAL DIRECTION
(LATERAL DEVIATION IN INCHES)

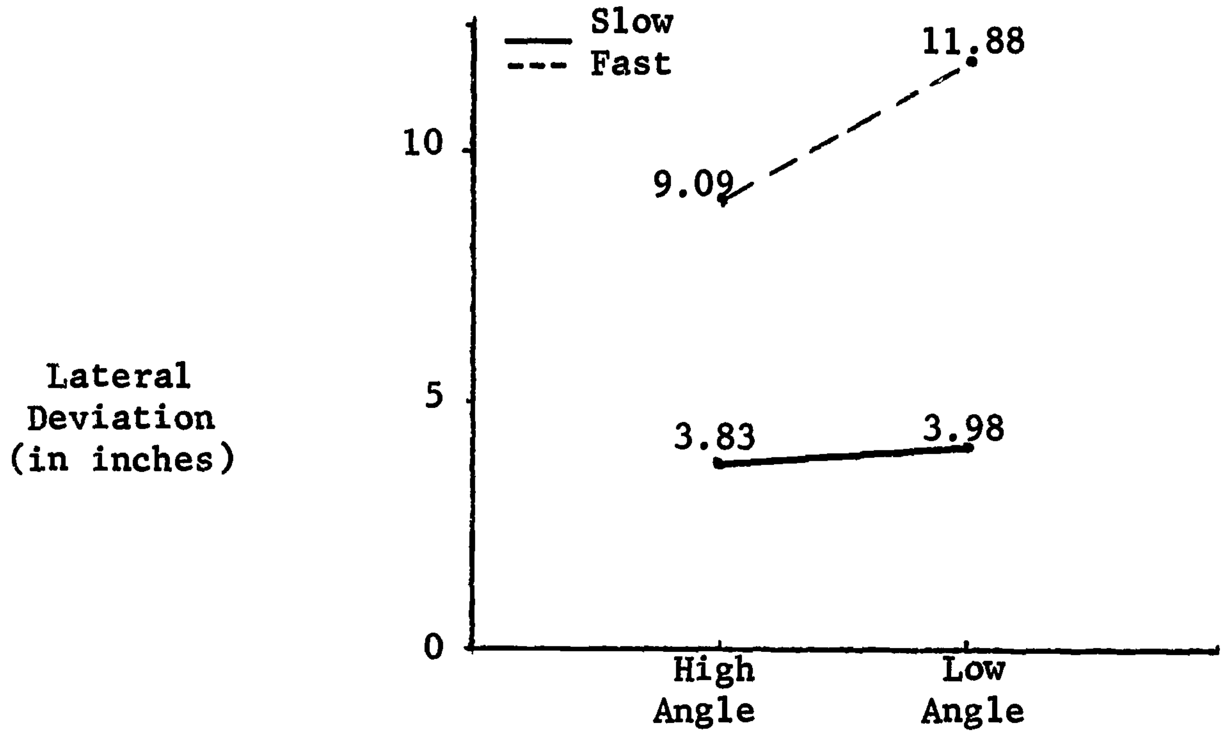
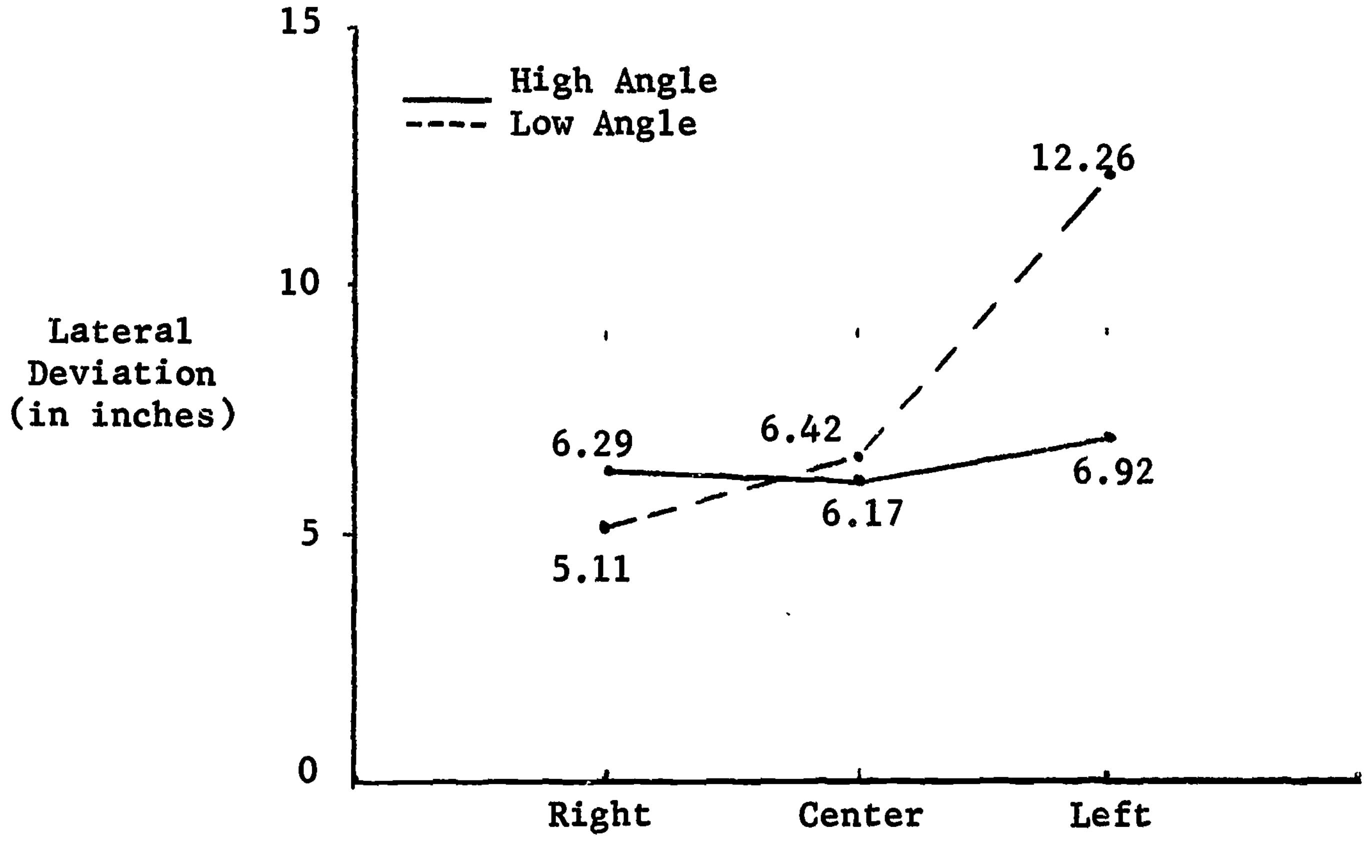


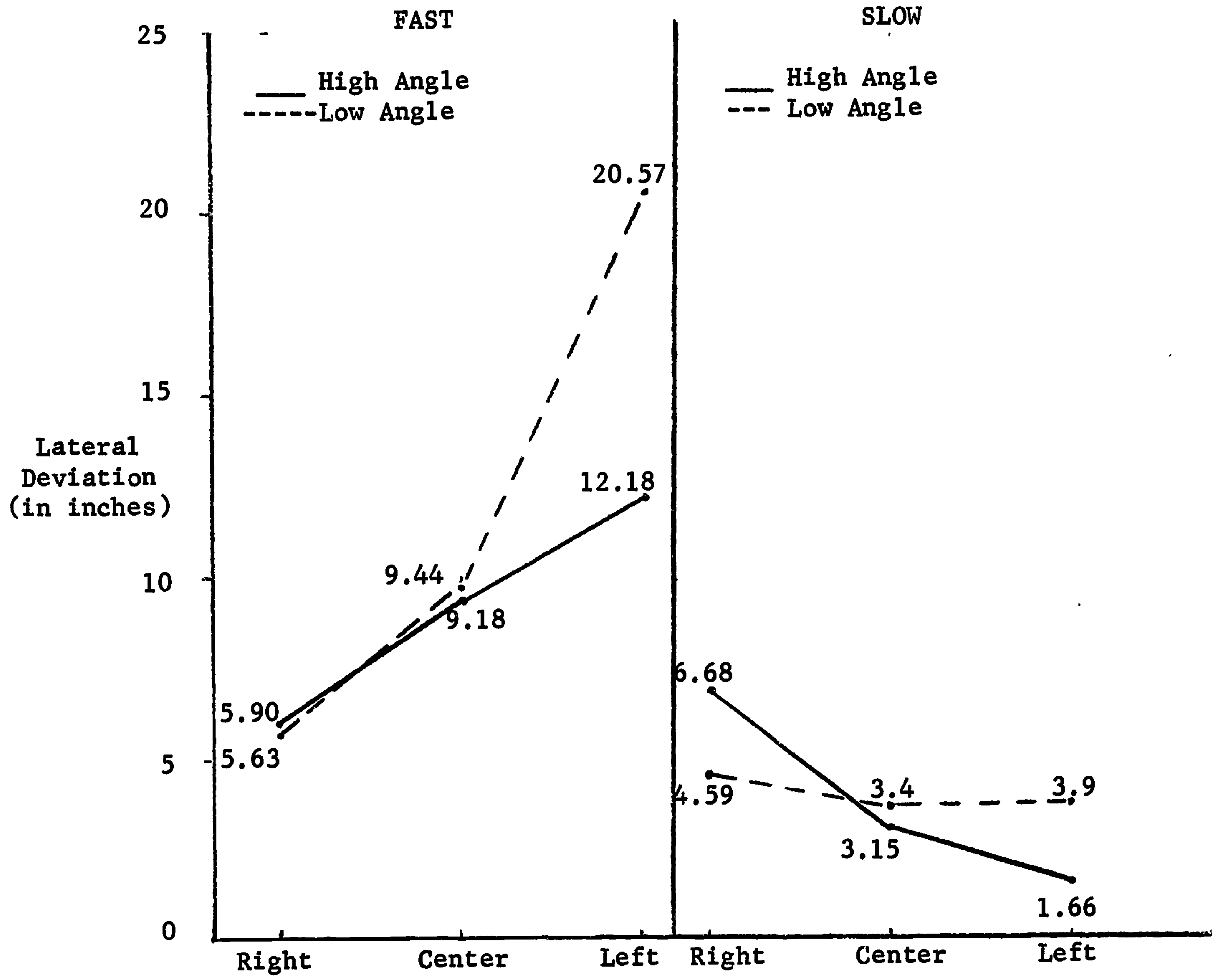
FIGURE 29. INTERACTION EFFECT: HORIZONTAL X VERTICAL DIRECTION (LATERAL DEVIATION IN INCHES)



X Horizontal X Vertical Direction (Figure 30, p. 99). The presence of these significant interactions indicated that, at least in terms of lateral or right-left error, the accuracy of the perceptual judgment made by the individual was dependent to a great extent upon the particular combination of stimulus characteristics he was judging.

The exact reason for these higher order interactions was difficult to establish. Figure 30, p.99, indicates that when the object was moving at a fast rate of speed, horizontal direction always affected the accuracy of the

FIGURE 30. INTERACTION EFFECT: SPEED X HORIZONTAL X VERTICAL DIRECTION (LATERAL DEVIATION IN INCHES)



visuo-perceptual judgment. In addition, when the object was projected to the left of the individual, the vertical direction of object flight also significantly affected the precision of the visuo-perceptual response. In this case, judgments about objects projected at a vertical angle of 34^{o} were significantly more accurate than those of objects projected at a greater vertical angle (44^{o}). When the object was projected to the right of or directly at the individual, the vertical direction of object flight had little or no effect upon the accuracy of the visuo-perceptual response. (See Table 20, p. 101.)

When the object was projected at a slow speed, the effect of vertical and horizontal direction of object flight was entirely different. For example, when the object was moving horizontally to the right, visuo-perceptual responses were significantly more accurate for objects projected at a low vertical angle (34^{o}) than for objects projected at a high vertical angle. Conversely, when the object was traveling horizontally to the left, objects projected at a vertical angle of 44^{o} were judged significantly more accurately than those projected at a lower vertical angle (34^{o}). For objects moving directly at the individual, vertical direction of object flight had no affect upon the accuracy of the visuo-perceptual response.

MOVEMENT TIME

Results of the analysis of movement time are shown in Table 21, p. 102.

Group Characteristics. No significant effect due to skill level was found. See Table 21. Thus skilled individuals tended to remain in motion equally as long as unskilled individuals. Although movement time decreased slightly with increasing age or maturity level, the difference between the various age groups was not statistically significant. In general then, regardless of skill or age classification, movement time tended to be the same across all individuals.

TABLE 20. SPATIAL ACCURACY OF THE VISUO-PERCEPTUAL JUDGMENT: COMPARISON OF MEANS (LATERAL DEVIATION)*

HORIZONTAL DIRECTION

RIGHT	CENTER	LEFT
5.70"	6.29"	9.59"

AGE X HORIZONTAL DIRECTION

RIGHT			CENTER			LEFT		
JR	HI	COLL	JR	HI	COLL	JR	HI	COLL
4.51"	4.75"	7.84"	5.49"	6.22"	7.17"	13.88"	9.37"	5.53"

HORIZONTAL X VERTICAL DIRECTION

RT-44°	CTR-44°	LFT-44°	RT-34°	CTR-34°	LFT-34°
6.29"	6.17"	6.92"	5.11"	6.42"	12.26"

SPEED X HORIZONTAL DIRECTION

FST-RT	FST-CTR	FST-LFT	SLO-RT	SLO-CTR	SLO-LFT
5.77"	9.31"	16.37"	5.63"	3.27"	2.81"

SPEED X VERTICAL DIRECTION

FST-44°	FST-34°	SLO-44°	SLO-34°
9.09"	11.88"	3.83"	3.98"

*Since all possible mean comparisons were not made, lines connect only those means which were compared. Solid lines indicate significance; broken lines indicate no significance.

TABLE 21. SUMMARY TABLE: ANALYSIS OF VARIANCE - MOVEMENT TIME

Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
Group Characteristics (Between Subjects)					
Age	8.8143	2	4.4071	1.28	5.08
Skill (Sk)	.2175	1	.2175	.06	7.19
Age X Sk	10.4239	2	5.2120	1.51	5.08
Subjects Within Groups	165.4332	48	3.4465		
Flight Characteristics (Within Subjects)					
Speed (Sp)	48.0095	1	48.0095	67.12*	7.19
Age X Sp	.7084	2	.3542	.495	5.08
Sk X Sp	.0002	1	.0002	-	7.19
Age X Sk X Sp	2.7157	2	1.3578	1.898	5.08
Speed X Subjects Within Groups	34.3322	48	.7153		
Horizontal Direction (HD)	19.1778	2	9.5889	30.42*	4.82
Age X HD	.9152	4	.2288	.73	3.51
Sk X HD	2.4818	2	1.2409	3.94	4.82
Age X Sk X HD	.5902	4	.1475	.47	3.51
HD X Subjects Within Groups	30.2605	96	.3152		
Vertical Direction (VD)	5.7533	1	5.7533	28.13*	7.19
Age X VD	.5554	2	.2777	1.36	5.08
Sk X VD	.1658	1	.1658	.81	7.19
Age X Sk X VD	.1058	2	.0529	.26	5.08
VD X Subjects Within Groups	9.8180	48	.2045		
Sp X HD	1.5588	2	.7794	4.07	4.82
Age X Sp X HD	.7371	4	.1843	.96	3.51
Sk X Sp X HD	.3615	2	.1807	.94	4.82
Age X Sk X Sp X HD	.8459	4	.2115	1.10	3.51
Sp X HD X Subjects Within Groups	18.3856	96	.1915		
Sp X VD	1.7270	1	1.7270	12.18*	7.19
Age X Sp X VD	.1055	2	.0528	.37	5.08
Sk X Sp X VD	.2142	1	.2142	1.51	7.19
Age X Sk X Sp X VD	1.2139	2	.6069	4.28	5.08
Sp X VD X Subjects Within Groups	6.8079	48	.1418		

TABLE 21. SUMMARY TABLE: ANALYSIS OF VARIANCE - MOVEMENT TIME (CONT'D)

Source of Variation	Sum of Squares	df	Mean Square	F-Test	Critical F-Value (.01)
HD X VD	.0578	2	.0289	.21	4.82
Age X HD X VD	.6705	4	.1676	1.23	3.51
Sk X HD X VD	1.1916	2	.5958	4.36	4.82
Age X Sk X HD X VD	.1999	4	.0499	.37	3.51
HD X VD X Subjects Within Groups	13.1148	96	.1366		
Sp X HD X VD	.2748	2	.1374	1.15	4.82
Age X Sp X HD X VD	.5801	4	.1450	1.22	3.51
Sk X Sp X HD X VD	.1303	2	.0652	.55	4.82
Age X Sk X Sp X HD X VD	.1969	4	.0492	.41	3.51
Sp X HD X VD X Subjects Within Groups	11.4468	96	.1192		

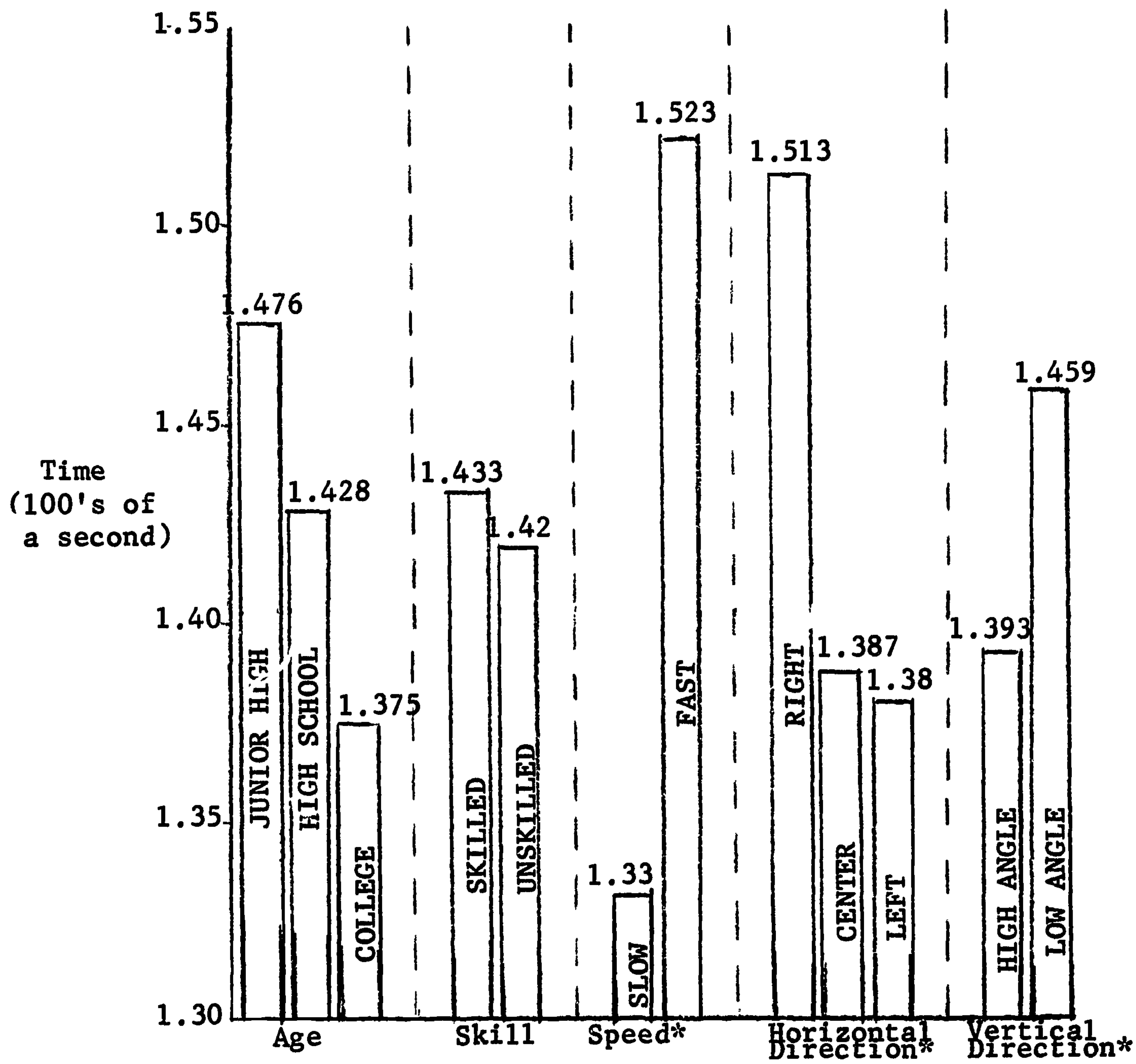
*Significant at the .01 level.

It should perhaps be pointed out that movement time, in this case, did not represent speed of movement as the distance traveled or covered by the individual during the time measured as movement time was free to vary. Thus the usefulness or meaningfulness of these particular data are open to question.

Stimulus Characteristics of the Moving Object. The three main effects of speed, horizontal and vertical direction of object flight were significant. The average movement time for each of these main effects is shown in Figure 31, p. 104. As can be seen, when the object was moving at a fast rate of speed, subjects tended to have significantly longer movement times than when the object was projected at a slow speed.

The vertical direction of object flight was also a significant factor affecting the total length of time the individual remained in motion. Subjects tended to have longer movement times when the object was projected at a flatter vertical angle (34^{o}) than when it was projected at a greater vertical angle (44^{o}).

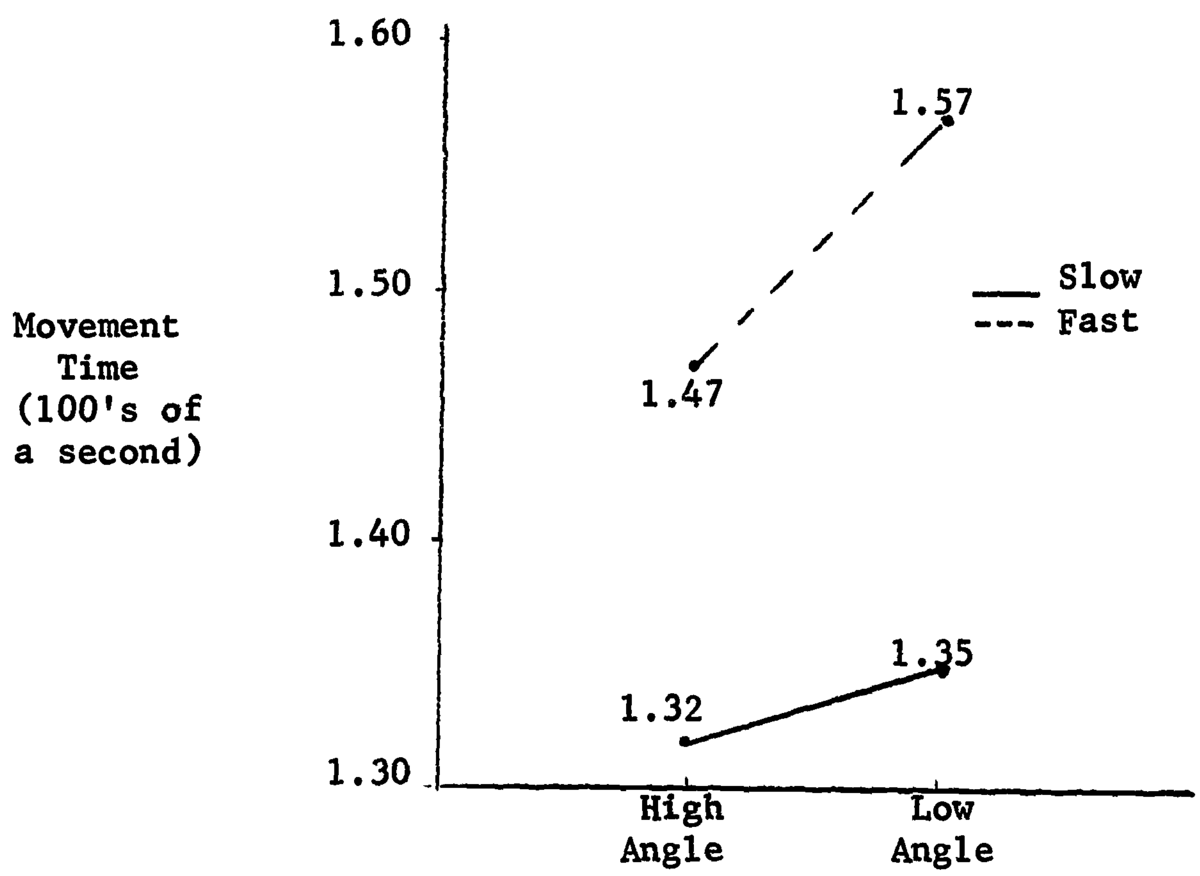
FIGURE 31. MOVEMENT TIME AS A FUNCTION OF GROUP AND STIMULUS CHARACTERISTICS



* Significant at .01

The significant interaction between Speed X Vertical Direction, shown in Figure 32, p. 105, indicated that the length of time the subject remained in motion was affected by the particular combination of speed and vertical direction of object flight. At a slow speed, the individual tended to remain in motion for equally long periods of time regardless of the vertical direction of object

FIGURE 32. INTERACTION EFFECT: SPEED X VERTICAL DIRECTION (MOVEMENT TIME IN 100'S OF A SECOND)



flight. When the object was projected at a fast speed, however, the vertical direction of flight appeared to significantly affect the amount of time the individual remained in motion. Movement time was longer for objects projected at a vertical angle of 34° than for objects projected at a vertical angle of 44°. (See Table 22, p. 106).

The horizontal direction of object flight also appeared to significantly affect the total movement time of the individual. When the object was projected to the right, the subject remained in motion significantly longer than when it was projected to his left or directly at him. (See Table 22.)

TABLE 22. MOVEMENT TIME: COMPARISON OF MEANS (1/100'S OF SEC)*

HORIZONTAL DIRECTION		
RIGHT	CENTER	LEFT
1.513	1.387	1.380

SPEED X VERTICAL DIRECTION			
FAST-44°	FAST-34°	SLO-44°	SLO-34°
1.47	1.57	1.32	1.35

*Since all possible mean comparisons were not made, lines connect only those means which were compared. Solid lines indicate significance; broken lines indicate no significance.

SUMMARY

Speed of the Visuo-Perceptual Response. (Reaction Time)

Group Characteristics. In terms of the speed of the visuo-perceptual response, skilled individuals judged the flight of the moving object significantly more rapidly than did unskilled individuals. Although the speed of the visuo-perceptual judgment tended to be faster in the older age groups, age or maturity level did not, in general, significantly affect the speed with which the individual visually judged the moving object in space.

Stimulus Characteristics of the Moving Object. The speed of the perceptual judgment was significantly affected by the speed and horizontal direction of object flight. In general, individuals responded significantly more rapidly to fast-moving objects than to slow-moving objects. Individuals also responded more quickly to objects moving horizontally to the right than to objects moving horizontally to the left or directly at them. Vertical direction of object flight, however, had no significant effect upon the speed of the visuo-perceptual response.

Spatial Accuracy of the Visuo-Perceptual Judgment. Group Characteristics. Without exception, the analysis of the measures of spatial accuracy (including radial, depth and lateral deviations) indicated that skilled individuals were significantly more accurate in judging the flight of the moving object than were unskilled individuals. In terms of distance or depth error, the visuo-perceptual response of the skilled individual was, on the average, twice as accurate as that of the unskilled person. With respect to radial or absolute error, the skilled individual again was significantly superior to the unskilled individual in judging the flight of the moving object in space. In terms of lateral error, the difference between the skilled and unskilled groups was small (skilled-6.35"; unskilled-8.04") but statistically significant.

The age or maturity level of the individual did not, in any case (radial, distance, or lateral error), significantly affect the accuracy of the visuo-perceptual judgment. In two instances, however, there were significant interactions between age and certain stimulus characteristics of the moving object. Analysis of the distance deviation measure revealed a significant interaction between age, speed and vertical direction of object flight. Analysis of the lateral deviation measure showed a significant interaction between age, speed and horizontal direction of object flight. Both of these interactions suggested that the effect of horizontal or vertical direction of object flight was much the same for all age groups when the object was moving at a _slow rate of speed_. The effect of the direction of object flight differed, however, for different age groups when the object was moving at a _fast rate of speed_. The exact nature of this effect, however, was unclear.

Stimulus Characteristics of the Moving Object.

(1) _Radial and Distance Error_. Without exception, the analysis of these two performance measures revealed the same significant relationships. In terms of radial and distance error, the main effects of horizontal and vertical direction of object flight were significant. This suggested that the accuracy of the visuo-perceptual response was affected by the particular vertical or horizontal direction in which the object was moving. The significant interaction between horizontal and vertical direction of object flight indicated, however, that the effect of horizontal direction held true only for objects projected at a vertical angle of 44°.

The main effect of speed of object flight was not significant. Speed seemed, however, to become important when it was combined with a given horizontal or vertical direction of object flight. The significant interaction between skill, speed, and vertical direction further suggested that the skilled individual was able to judge fast-moving objects equally accurately regardless of the vertical direction of object flight. The accuracy of the perceptual response of the unskilled individual was, on the contrary, affected in different ways by the vertical direction of the object's flight. For slow-moving objects, the effect of the vertical direction of object flight was much the same for both skill groups. (It should be kept in mind that _in all instances_ the skilled individual was significantly more accurate than the unskilled.)

(2) _Lateral Deviation_. Analysis of the Lateral Deviation measure revealed the following significant effects: Speed, Horizontal Direction, Vertical Direction, Speed X Horizontal Direction, Speed X Vertical Direction, Horizontal

Direction X Vertical Direction, and Speed X Vertical Direction X Horizontal Direction. In terms of right-left error, then slow-moving objects were judged more accurately than fast-moving objects; objects moving to the right of or directly at the individual were judged more accurately than objects moving to the left of the individual; and objects projected at a greater vertical angle (44^{o}) were judged more accurately than those projected at a flatter vertical angle (34^{o}). The significant interaction between speed, horizontal and vertical direction suggested that when objects were moving at a fast rate of speed, the horizontal direction of object flight always significantly affected the accuracy of the visuo-perceptual judgment. Vertical direction, however, was important only when the object was moving to the left. For objects moving at a slow rate of speed, vertical and horizontal direction of object flight interacted in specific ways to affect the accuracy of the visuo-perceptual judgment.

Movement Time. There were no significant differences between age or skill groups in terms of the length of time the individual remained in motion. Movement times were in general significantly longer when objects were moving at a fast rate of speed than when they were moving at a slow rate of speed. Movement times were also significantly longer when objects were projected to the right of the individual than when they were projected at a horizontal angle of 0^{o} or 5^{o}-left. When objects were projected at a vertical angle of 34^{o}, individuals tended to remain in motion significantly longer than when they were projected at a vertical angle of 44^{o}. The interaction between Speed X Vertical Direction was significant. At the slow speed, the vertical direction of object flight appeared to have little or no effect upon the movement time of the individual. On the other hand, when the object was moving at a fast rate of speed, movement time was significantly longer for objects projected at a vertical angle of 34° than for objects projected at a vertical angle of 44°. The value of this performance measure is questionable.

CHAPTER VI

SUMMARY, DISCUSSION, CONCLUSIONS

SUMMARY

The purpose of the present study was threefold: (i) to assess the effects of systematic variation in velocity and direction of ball flight upon visuo-perceptual judgments made about moving objects in space; (ii) to determine whether or not highly-skilled and poorly-skilled performers differ in their ability to visually judge the flight of a moving object in three-dimensional space, and (iii) to assess the effect of age or maturity level of the individual upon the speed and accuracy of such visuo-perceptual judgments.

The experimental situation was as follows: a tennis ball was projected into the air from a Tennis Ball-Boy machine. The ball was interrupted in its flight by a canvas suspended four to five feet above the head of the subject. Subjects thus never came into actual physical contact with the moving object. The task of the subject was to visually judge the flight of this moving object, that is, to decide where the object was going in its flight, to select an 'optimum point for interception', and then to move as quickly as possible to that selected spot.

Five variables were selected for study. These included:

(a) Speed of Object Projection (two levels), used to assess the effects of velocity of ball flight upon judgments about moving objects in space;

(b) Vertical Angle of Object Projection (two levels), used to assess the effects of the vertical direction of object flight upon visuo-perceptual judgments about moving objects in space;

(c) Horizontal Angle of Object Projection (three levels), which served as a basis for evaluating the effects of horizontal direction of object flight upon visual judgments about the flight of moving objects;

(d) Skill Level (two levels); and

(e) Age or Maturity Level (three levels).

These latter two variables provided the bases for looking at differences in visuo-perceptual performances as a function of skill and/or age classification.

A total of fifty-four (54) subjects participated in the study. Eighteen subjects each were selected from a population of junior high, high school, and college age males. Of the eighteen subjects thus selected, nine were further classified as skilled, nine as unskilled. The criteria for skill classification were: (a) the number of years of participation in organized baseball competition, including varsity and/or Little League membership and (b) the position held by the individual in a distribution of scores based upon performances on an Overarm Throw for Velocity test. Subjects were also screened for minimum visual acuity and depth perception capacity.

Measures of the visuo-perceptual judgment included a reaction time measure, a movement time index, and three measures of the spatial accuracy of the visuo-perceptual judgment. The data were analyzed by means of five separate uni-variate analyses of variance, each using a single performance index per analysis. Where appropriate, Scheffe's Multiple-Comparisons Test was used to compare differences between group means.

DISCUSSION

Before the turn of the century Sechenov, a Russian physiologist, asserted that all of man's behavior could be thought of as consisting of three main processes: (a) a sensory input, (b) a cortical process, and (c) an efferent or motor outflow. Sechenov further hypothesized that the last of these processes, the efferent or motor output, was dependent in large part upon the nature of the sensory input and the central elaboration or processing of that sensory input. (65)

Modern day information processing theories have adopted a similar kind of schema in an attempt to explain the nature and functioning of the nervous system of man. Such theories suggest that one of the most important steps leading to the production of any motor act is the receiving and processing of sensory information appropriate to that behavior. (114) The processing of such sensory information, it is suggested, involves the changing or encoding of the physical stimulation received by the individual into some neural form. Accordingly, this sensory information is then translated, by means of intricate central nervous system processes, into appropriate motor or efferent output. The end result of this information processing cycle, then, is the behavior which we observe, the overt movement or motor response. The overall success or failure of the motor act, according to such theories, is largely governed by the effectiveness of the information processing mechanism of the individual, that is, by the speed and precision with which incoming sensory information can be processed. According to this formulation, then, the speed and precision with which the flight of a moving object in space could be judged would be dependent, to a large extent, upon how quickly and accurately pertinent visual information, derived from the flight of the moving object itself, could be processed by the individual. It is within this general framework that the following discussion is presented.

Problem I. What are the effects of systematic variation in velocity and direction of ball flight upon the speed and precision with which visuo-perceptual judgments are made about moving objects in space?

<u>Accuracy of the Visuo-Perceptual Judgment</u>. Data from the present study indicated that the accuracy with which the individual was able to judge the flight of a moving object in space was, in most cases, dependent upon the particular speed, horizontal and/or vertical direction in which the object was moving. For example, objects projected at a high vertical angle were judged more accurately when they were traveling at a slow speed while objects projected at a flatter vertical angle were judged more accurately when they were traveling at a fast rate of speed. Along the same line, objects projected at a high vertical angle (44°) were judged more accurately if they were also moving directly toward the individual. Objects projected at a flatter vertical angle (34°), however, were judged equally accurately regardless of the horizontal direction in which they were moving.

From an information processing point of view, it would appear, then, that certain kinds or combinations of visual cues were more difficult for the individual to process accurately than were certain others. That is, the accuracy with which the flight of the moving object in space was judged was a function of the particular combination of visual cues which had to be judged. It is interesting to note that psychologists have also shown in a number of other studies that the precision of judgments about <u>static</u> stimulus situations varies markedly depending upon the nature and arrangement of the elements making up the stimulus complex. (21,27,35,85) Apparently, <u>dynamic</u> three-dimensional stimulus situations are no exception to this rule.

The combined effect of speed and horizontal direction of object flight upon the accuracy of the visuo-perceptual response was particularly interesting. The nature of this interaction was as follows: When the object was moving to the right or directly at the individual, the speed of its flight had no effect upon the precision with which the moving object was judged. On the other hand, when the object was moving horizontally to the left, the speed at which the object was traveling became an important factor affecting the accuracy of the perceptual response. In this instance, individuals judged the flight of a slow-moving object significantly more precisely than that of a fast-moving object.

One of the factors which purportedly affects the accuracy of information processing is the rate at which such information must be handled. In other words, information received at a fast rate of speed appears to be more difficult to process accurately than information received at a slow rate of speed. (114) On this basis, then, one might have expected fast-moving objects to be more difficult for individuals to accurately judge than slow-moving objects. The present data indicated, however, that speed alone did not significantly affect the accuracy with which the flight of the moving object was judged. Why then did the predicted speed affect appear when the object was moving horizontally to the left of the individual? The writer is inclined to speculate that a part of the reason this particular speed-horizontal direction effect was observed is related to the concept of sensory dominance.

Let us assume, for purposes of discussion, that the sensory dominance or 'sidedness' of the individual is related to the accuracy of information processing in such a way that sensory information received from objects or events related to the non-dominant side of the individual is more difficult to process accurately than information received from similar objects or events related to the dominant side. Under this set of rules, then, a 'right-sided' individual would, in general, have more difficulty in judging the flight of an object moving to his left than in judging the flight of an object moving to his right. If we add to this then an increase in the rate at which such information must be processed, due to an increase in the speed of the flight of the moving object, an additional stress is placed on the information processing mechanism of the individual, a stress which could result in a decrease in the accuracy with which fast-moving objects were judged. In other words, it is possible that when the object was moving to the left of the individual but at a slow rate of speed, the visual information concerning the flight of the moving object was received at a rate slow enough to permit accurate processing of the incoming information. However, when the speed of this moving object was increased, the rate at which sensory information was received and processed also increased and, as a result, accurate processing of the incoming sensory information may not have been possible. If this were the case, then, judgments about the flight of fast-moving objects, traveling horizontally to the left, would have been less accurate than those for objects moving in the same direction but at a slow rate of speed.

Although the foregoing discussion provides a rather interesting analysis of this particular speed-direction effect, it is important to point out that no information concerning the 'sidedness' of the individual subjects participating in the study was acquired. Therefore a test of the validity of such an explanation must necessarily await future research in this area. Such data as these do, however, suggest that we may need to begin to look more closely at the problem of sensory dominance and the role it plays in the performance of gross motor skills.

<u>Speed of the Perceptual Response</u>. The speed with which the visuo-perceptual judgment was made was dependent upon three factors: (a) the speed of the moving object; (b) the horizontal direction in which the object was traveling; and (c) the level of skill of the individual judging the moving object. (This latter effect will be discussed in a later section. See Problem II, p. 118.)

In general, objects traveling at a fast rate of speed were responded to significantly more quickly than were objects moving at a slower rate of speed. It is doubtful, however, that this represents the true effect of velocity of object flight upon the speed of the visuo-perceptual judgment. Rather, it is more likely a reflection of the instructions given to the subject and of the general experimental situation itself. Due to the nature of the experimental situation, when the object was traveling at a fast rate of speed, the individual was forced to cover a greater distance to get to the desired point of interception than when the object was traveling at a slow rate of speed. Since subjects were instructed to move 'just as though they were actually going to try to catch the ball', the question arises of whether or not the individual actually required a longer time to 'visually judge' the flight of the slow-moving object or if he simply waited longer before responding because he knew he had more time to reach the desired point of interception? As a result of this artifact in the experimental situation, no clear-cut statement concerning the effect of velocity of ball flight upon the speed of the visuo-perceptual response can be made.

The other factor which appeared to affect the speed of the visuo-perceptual response was the horizontal direction in which the object was traveling. In this case, objects moving to the right of the individual were responded to more quickly than objects moving to the left or directly at the individual. This indicated that, at least in the present study, individuals tended to make their judgments about the flight of the moving object more quickly when it was moving to the right than when it was moving in either of the other two horizontal directions. In connection with this, it should also be noted that judgments about the flight of objects moving horizontally to the right were always as <u>accurate</u>, if not more so, than judgments about objects moving to the left. This suggests that less time was needed by the individual to <u>accurately</u> process visual information derived from an object moving horizontally to the right than to process similar visual information derived from an object moving horizontally to the left. Why this should be so is, of course, puzzling. Although the writer is again inclined to speculate that such effects may, in part, be related to the 'sensory dominance' of the individual, that is, to whether or not the individual judging the flight of the moving object was predominantly a 'right-sided' or a 'left-sided' individual, there is little or no evidence presently available to support such an assertion.

Problem II. Do highly-skilled and poorly-skilled individuals differ in their capacity to visually judge the flight of a moving object in space?

There is little doubt that skilled motor performance involves, in the final analysis, complex interactions among the various physiological systems of the body. From an information processing point of view, however, an important part of the performance of any motor behavior is the effective processing of sensory information basic to the performance of that behavior. If this is true, then one of the things that should differentiate between the highly-skilled and the poorly-skilled individual is the capacity to process, rapidly and accurately, sensory information pertinent to the successful performance of a given motor act.

Data from the present study strongly support such an assertion. For example, individuals classified as 'skilled' were, without exception, significantly more accurate than individuals classified as 'unskilled' in visually judging the flight of a moving object in space. In terms of the speed with which such judgments were made, the perceptual responses of the skilled individual were always significantly faster than those of the unskilled. Such findings as these do suggest, then, that the skilled individual may be able to process incoming sensory information at a faster rate and with a greater degree of accuracy than can the unskilled. In other words, it may be that the highly-skilled performer does, in fact, possess a sensori-perceptual mechanism that is superior to that of the unskilled performer.

It is also interesting to note that in two instances (radial and distance deviation measures), there was a significant interaction between the level of skill of the individual and the accuracy with which certain combinations of visual cues were judged. In both cases, the nature of the interaction was such that it pointed to some interesting differences between the skilled and the unskilled individual in terms of their respective abilities to accurately judge the flight of a <u>fast-moving object in space</u>. In general, skilled individuals were able to judge the flight of a fast-moving object equally well regardless of the vertical direction of its flight. However, the precision with which unskilled individuals judged the flight of a fast-moving object was significantly affected by the vertical direction in which the object was moving. Furthermore, when the object being judged was moving at a <u>slow rate of speed</u>, no such skill effect was observed. Although much more definitive work needs to be done in this area, these results indicated that not only was the skilled individual more accurate, in general, in his judgment of the moving object in space but that he was also capable of handling certain complex kinds of sensory information more easily than was the unskilled individual. This suggests of course that in many instances the differences in the sensori-perceptual capacities of the skilled and unskilled individual may be very subtle ones.

Problem III. What is the effect of age or maturity level upon the speed and accuracy with which the individual judges the flight of a moving object in space?

One of the things which is believed to characterize the growth and development of the perceptual apparatus of the individual, and particularly of the young child, is an increase in the capacity for processing complex sensory information with greater and greater efficiency. (8,45,101) In other words, it is believed that as the individual matures, his perceptual apparatus becomes functionally more efficient. This enables him to process available sensory information more rapidly and accurately than before and thus he is able to make increasingly more accurate judgments about stimulus situations which confront him in his environment.

The results of the present investigation indicated, however, that age had no effect upon the speed or precision with which the individual responded to a moving object in space. That is, there were no significant differences among junior high, high school and college age males (average ages respectively: 12, 16, 20) in terms of the speed and accuracy with which they judged the flight of a moving object in three-dimensional space. (It should perhaps be noted that although there was some indication that the speed of the perceptual response was faster in the older age groups, these differences were not statistically significant.) In a recent study concerned with the development of visual perception in the young child, Williams (109) reported that visuo-perceptual abilities involved in judging the flight of a moving object in space appeared to be functionally mature at about eleven years of age. Since the average age of the youngest group studied in the present investigation was twelve, this may account for the fact that no significant age differences were found.

Some mention should be made of the significant interaction between age, speed and vertical direction of object flight (distance deviation). The presence of this interaction indicated that certain combinations of visual cues were more difficult for one age group to judge than another. In other words, although the age of the individual did not, in general, affect the accuracy of the perceptual response, there were instances when certain combinations of visual cues were being judged that age became important. However, as it now stands it would appear that the major part of the growth and development of the perceptual apparatus of the individual is completed by the time the individual reaches junior high school and that thereafter age has little or no effect upon the speed or accuracy with which the individual judges the flight of a moving object in space.

CONCLUSIONS

The following conclusions are based upon a careful study and analysis of data from the present investigation.

(1) The speed and accuracy with which the flight of a moving object is judged is, to a large extent, dependent upon the specific set of visual cues involved, that is, upon the particular speed, horizontal and/or vertical direction in which the object is moving at the time it is being judged;

(2) Individuals classified as highly-skilled are significantly superior to individuals classified as poorly-skilled in visually judging the flight of a moving object in space; and

(3) Age, as represented by a sample of junior high, high school and college age males, has little or no effect upon the speed and accuracy with which the individual judges the flight of a moving object in three-dimensional space.

SUGGESTIONS FOR FURTHER STUDY

1. Data from the present investigation indicated that certain combinations of visual cues were more difficult to judge (interpret) accurately than were certain others. If we are to enhance the degree of success experienced by the individual in learning and/or performing certain gross motor skills, then we need to begin to identify more specifically the kinds of visual cues involved in the performance of such motor skills and to evaluate them in terms of the kinds of demands which they place upon the sensori-perceptual apparatus of the individual.

2. If the apparent differences in visuo-perceptual capacities of the highly-skilled and the poorly-skilled sports performer do exist, it is important to establish whether or not such differences are innate ones or if the 'potentially' unskilled individual can be <u>trained</u> to use his visuo-perceptual apparatus more effectively through properly planned and appropriately timed perceptual-motor experiences.

3. Evidence from the present study tended to support the notion that the growth of the visuo-perceptual mechanism of the individual

was nearly complete by the age of twelve. This points to an obvious need to outline the pattern of growth of such capacities in the young child and to develop new methods and techniques for improving or enhancing the development of such capacities.

BIBLIOGRAPHY

1. Ayres, A. Jean. "Patterns of Perceptual-Motor Dysfunction in Children: A Factor Analytic Study," Perceptual-Motor Skills 20: 335-68, 1965.

2. Baldwin, Robert D., Davis J. Chambliss and A. Dean Wright. "Target Detectability as a Function of Target Speed, Noise Level, and Location," Journal of Applied Psychology 46: 26-30, 1962.

3. Bandzejova, Maria. "Reaktivita v zavislosti od poloky podnetu v zrakovom poli," (Reaction Time as a Function of the Stimuli Position in the Visual Field) Psychologica 16: 179-212, 1965.

4. Banister, H. and J.M. Blackburn. "An Eye Factor Affecting Proficiency in Ball Games," British Journal of Psychology 21: 382-84, 1931.

5. Barclay, George Davis. "The Relationship Between Efficient Vision and Certain Sensory Motor Skills." Unpublished Doctoral dissertation, New York University, New York, 1938.

6. Beck, Jacob. "Age Differences in Lightness Perception," Psychonomic Science 4: 201-202, 1966.

7. Bennett, Edward M. Human Factors in Technology. New York: McGraw Book Company, 1963.

8. Birch, H.G. and Arthur Lefford. "Intersensory Development in Children," Monograph of Sociological Research and Child Development 28: 2-47, 1963.

9. Bitterman, M.E. "Phyletic Differences in Learning," American Psychologist 20: 396-410, 1965.

10. Bortner, M. and H.G. Birch. "Perceptual and Perceptual-Motor Dissociation in Cerebral Palsied Children," Journal of Nervous and Mental Disorders 134: 103-108, 1962.

11. Bower, T.G. "The Visual World of Infants," Scientific American 215: 80-97, 1966.

12. Braine, L.G. Mind, Perception, and Science. Oxford: Blackwell Scientific Publications, 1951.

13. Brown, Donald, James Naylor, and Kenneth H. Michels. "Perception of Real Movement as a Function of Angle of Approach," American Journal of Psychology 75: 144-46, 1962.

14. Brown, J.F. "The Thresholds for Visual Movement," Psychological Forschung 14: 249-68, 1931.

15. Brown, R.H. and J.E. Conklin. "The Lower Thresholds of Visible Movement as a Function of Exposure Time," American Journal of Psychology 67: 104, 1954.

16. Bruce, Russell. "The Effects of Variations in Ball Trajectory upon the Catching Performance of Elementary School Children." Unpublished Doctoral dissertation, University of Wisconsin, Madison, 1966.

17. Carlson, V.R. "Adaptation in the Perception of Visual Velocity," Journal of Experimental Psychology 64: 192, 1962.

18. Carr, Harvey A. "Influence of Vision in Acquiring Skill," Journal of Experimental Psychology 5: 301-11, 1922.

19. Carr, Harvey A. An Introduction to Space Perception. New York: Longmans Green, 1935.

20. Clark, B. and N. Warren. "Depth Perception and Interpupillary Distance as Factors in Proficiency in Ball Games," American Journal of Psychology 47: 485-87, 1935.

21. Corah, Norman L. "Effects of the Visual Field upon Perception of Change in Spatial Orientation," Journal of Experimental Psychology 70: 598-601, 1965.

22. Cratty, Bryant. Movement Behavior and Motor Learning. Philadelphia: Lea & Febiger, 1964.

23. Damron, Frazier C. "A Comparative Study of Two-Dimensional Slides in Teaching Recognition of Fundamental Football Defenses in High School Football Players." Unpublished Doctoral dissertation, University of Indiana, Bloomington, 1952.

24. Fleischman, Edwin A. "A Comparative Study of Aptitude Patterns in Unskilled and Skilled Psychomotor Performances," Journal of Applied Psychology 41: 263-72, 1957.

25. Fleischman, Edwin A. and Walter E. Hempel, Jr. "Changes in Factor Structure of a Complex Psychomotor Test as a Function of Practice," Psychometrika 19: 239-52, 1954.

26. Fleischman, Edwin A. and Walter E. Hempel, Jr. "Factorial Analysis of Complex Psychomotor Performance and Related Skills," Journal of Applied Psychology 40: 96-104, 1956.

27. French, Robert S. "Pattern Recognition in the Presence of Visual Noise," Journal of Experimental Psychology 47: 27-31, 1954.

28. Gemelli, A. "The Visual Perception of Movement," American Journal of Psychology 75: 144-46, 1962.

29. Gerhard, D.J. "The Judgment of Velocity and Prediction of Motion," Ergonomics 2: 287-304, 1959.

30. Gesell, Arnold, Frances L. Ilg and Glenna E. Bullis. Vision: Its Development in Infant and Child. New York: Paul B. Heober, Inc., 1949.

31. Gibson, E.J. "Development Study of Visual Search Behavior," Perception and Psychophysics 1: 169-71, 1966.

32. Gibson, E.J. and R.D. Walk. "The Visual Cliff," Scientific American 202: 67-71, 1960.

33. Gibson, J.J. "Motion Picture Testing and Research," U.S. Army Air Force, Aviation Psychology Research Program Report No. 7, 1947.

34. Gibson, J.J. The Perception of the Visual World. Boston: Houghton Mifflin Co., 1950.

35. Gogel, Walter C. "Perception of the Relative Distance Position of Objects as a Function of Other Objects in the Field," Journal of Experimental Psychology 47: 335-42, 1954.

36. Goldstein, A.G. "Judgments of Visual Velocity as a Function of Length of Observation Time," Journal of Experimental Psychology 54: 457-61, 1957.

37. Goldstein, Jacob and Charles Weiner. "On Some Relations Between Perception of Depth and of Movement," Journal of Psychology 55: 3-23, 1963.

38. Gottsdanker, Robert M. "The Accuracy of Motion Prediction," Journal of Experimental Psychology 43: 26-36, 1952.

39. Gottsdanker, Robert M. "Assessment of Motion as Influenced by Structure of Background," Scandinavian Journal of Psychology 3: 122-28, 1962.

40. Gottsdanker, Robert M. "A Further Study of Motion Prediction," American Journal of Psychology 68: 432-37, 1955.

41. Gottsdanker, Robert, James W. Grick and Robert B. Lockard. "Identifying the Acceleration of Visual Targets," British Journal of Psychology 52: 31-42, 1961.

42. Graham, C.H. "Visual Perception," In Stevens, S.S. (Ed.) Handbook of Experimental Psychology. New York: Wiley and Sons, 1951.

43. Granit, Ragnar. Receptors and Sensory Perception. New Haven and London: Yale University Press, 1962.

44. Graybiel, A. et al. "Accomodation, Visual Fields, Ocular Muscle Balance and Depth Perception of Athletes," Research Quarterly 26: 480, 1955.

45. Gregory, R.L. Eye and Brain, the Psychology of Seeing. New York: McGraw-Hill Book Company, Inc., 1966.

46. Haith, Marshall M. "The Response of the Human Newborn to Visual Movement," Journal of Experimental Child Psychology 3: 235-43, 1966.

47. Harris, Charles S. "Adaptation to Displaced Vision: Visual, Motor, or Proprioceptive Change?" Science 140: 812-13, 1963.

48. Harris, Chester W. "Statistical Methods," In Harris, C.W. (Ed.) Encyclopedia of Educational Research. New York: Macmillan, 1960.

49. Hays, William L. Statistics for Psychologists. New York: Holt, Rinehart and Winston, 1965.

50. Held, Richard. "Plasticity in Sensory-Motor Systems," Scientific American 213: 84-97, 1965.

51. Held, Richard and Alan Hein. "Adaptation of Disarranged Hand-Eye Coordination Contingent upon Re-Afferent Stimulation," Perceptual-Motor Skills 8: 87-90, 1958.

52. Held, Richard and Alan Hein. "Movement Produced Stimulation in the Development of Visually Guided Behavior," Journal of Comparative Physiological Psychology 56: 872-76, 1963.

53. Hoepner, Barbara J. "Comparison of Motor Ability, New Motor Learning, and Adjustment to a Rearranged Visual Field." Unpublished Doctoral dissertation, Pennsylvania State University, University Park, 1963.

54. Hubbard, A.W. "Psychological Aspects of Human Movement and Perception," College Physical Education Association Proceedings: 58-67, 1956.

55. Hubbard, A.W. and C.N. Senge. "Ball Speeds and Effect on Batting Movement," Research Quarterly 25: 42, 1954.

56. Jeffrey, W.E. "Discrimination of Oblique Lines by Children," Journal of Comparative Physiological Psychology 62: 154-56, 1966.

57. Johansson, G. "Configurations in the Perception of Velocity," Acta Psychologica 7: 25-79, 1954.

58. Jones, Lyle V. "Some Illustrations of Psychological Experiments Designed for Multivariate Statistics." Psychometric Laboratory, University of North Carolina, November, 1960.

59. Kabrick, John L. "Effects of Physical Location of Visual Stimulati on Intentional Response Time," Journal of Engineering Psychology 4: 1-8, 1965.

60. Kaiser, Peter K. "Investigation of Shape at a Slant," Proceedings of Seventy-Fourth Annual Convention of the American Psychological Association: 9-10, 1966.

61. Kalmus, H. "Inherited Sense Defects," In Stanley Coopersmith (Ed.) Frontiers of Psychological Research. San Francisco: W.H. Freeman and Company, 1966.

62. Katsui, A. "A Developmental Study on the Perception of Direction in Two-Dimensional Space," Japanese Journal of Psychology 23: 63-70, 1962.

63. Keller, L.F. "The Relation of 'Quickness of Bodily Movement' to Success in Athletics," Research Quarterly 13: 146-55, 1942.

64. Kerlinger, Fred N. Foundations of Behavioral Research. New York: Holt, Rinehart and Winston, Inc., 1966.

65. Kimble, G.A. Hilgard and Marquis: Conditioning and Learning. New York: Appleton-Century-Crofts, 1961.

66. Kreiger, Carol Jane. "The Influence of Figure-Ground Perception on Spatial Adjustment in Tennis." Unpublished Master's thesis, The University of California, Los Angeles, 1962.

67. Kretchmar, R.T. "Vision in Sports," Research Quarterly 20: 238, 1949.

68. Kurke, Martin I. "Role of Motor Experience in the Visual Discrimination of Depth," Journal of Genetic Psychology 86-87: 191-96, 1955.

69. Lit, Alfred and Harlyn D. Hamm. "Depth-Discrimination Thresholds for Stationary and Oscillating Targets at Various Levels of Retinal Illuminance," Journal of the Optical Society of America 56: 510-16, 1966.

70. London, I. "A Russian Report on the Post-Operative Newly Seeing," American Journal of Psychology 73: 478-82, 1960.

71. Matin, Leonard and George Kebler. "Acuity of Visual Perception of Direction in the Dark for Various Positions of the Eye in the Orbit," Perceptual-Motor Skills 22: 407-20, 1966.

72. McCloy, C.H. "Spatial Relations as a Factor in Motor Educability," Research Quarterly 11: 33, 1940.

73. McCormick, Ernest James. Human Engineering. New York: McGraw-Hill Book Company, 1957.

74. Miller, Donna Mae. "The Relationship between Some Visual-Perceptual Factors and the Degree of Success Realized by Sports Performers." Unpublished Master's thesis, University of Southern California, Los Angeles, 1960.

75. Morgan, Clifford T. "Some Structural Factors in Perception," In Deardslee, David C. and Michael Wertheimer, Readings in Perception. Princeton: D. Van Nostrand Co., Inc., 1958.

76. Mortimer, Elizabeth M. "Basketball Shooting," Research Quarterly 22: 234-43, 1951.

77. Mueller, Conrad G. Sensory Psychology. Englewood Cliffs: Prentice-Hall, Inc., 1965.

78. Mussen, Paul H. The Psychological Development of the Child. Englewood Cliffs: Prentice-Hall, Inc., 1965.

79. Nelson, T.M. "A Study Comparing Visual and Visual-Motor Perceptions of Unimpaired, Defective, and Spastic Cerebral Palsied Children," Journal of Genetic Psychology 101: 299-332, 1962.

80. Notterman, J. M., G.A. Cicala and D.C. Page. "Demonstration of the Influence and Response Categories of Difference Limens," Science 131: 983-84, 1960.

81. Olsen, E.A. "Relationship between Psychological Capacities and Success in College Athletics," Research Quarterly 27: 79, 1956.

82. Overton, Willis and Morton Wiener. "Visual Field Position and Word-Recognition Threshold," Journal of Experimental Psychology 71: 249-53, 1966.

83. Pierson, William R. "Comparison of Fencers and Non-Fencers by Psychomotor, Space Perception, and Anthropometric Measures," Research Quarterly 27: 90, 1956.

84. Rao, C.R. Advanced Statistical Methods in Biometric Research. New York: Wiley and Sons, 1952.

85. Rochlin, Alan M. "The Effect of Tilt on the Visual Perception of Parallelness," American Journal of Psychology 68: 223-236, 1955.

86. Reisen, A. "Arrested Vision," Scientific American 183: 16-19, 1950.

87. Reisen, A. "The Development of Visual Perception in Man and Chimpanzee," Science 106: 107-108, 1947.

88. Rey, A. "La Perception d'un Ensemble de Displacements," Rev int Filmol: 75-92, 1954.

89. Roy, S.N. Some Aspects of Multivariate Analysis. New York: Wiley and Sons, 1957.

90. Seigel, A.I. "A Motor Hypothesis of Perceptual Development," American Journal of Psychology 66: 301-304, 1953.

91. Sherman, Hoytl L. "Aspects of Visual Perception and Their Relationship to Motor Activity," College Physical Education Association Proceedings: 8-16, 1950.

92. Smith, K.U. and W.M. Smith. Perception and Motion. Philadelphia: Saunders Co., 1962.

93. Snyder, F.W. and N.H. Pronko. Vision with Spatial Inversion. Wichita: University of Wichita Press, 1952.

94. Solomon, Philip et al (Eds.) Sensory Deprivation. A Symposium held at Harvard Medical School. Cambridge, Mass: Harvard University Press, 1961.

95. Stallings, Loretta M. "The Role of Visual-Spatial Abilities in the Performance of Certain Motor Skills." Unpublished Doctoral dissertation, University of Texas, Austin, 1965.

96. Stroup, F. "Relationship Between Measurements of Field of Motion Perception and Basketball Ability in College Men," Research Quarterly 28: 72, 1957.

97. Tagaki, K. "On Visual Estimation of Length of Various Curves," Japanese Journal of Psychology 1: 476-98, 1926.

98. Tussing, Lyle. "The Effects of Football and Basketball on Vision," Research Quarterly 11: 16-18, 1940.

99. Updegraff, Ruth. "The Visual Perception of Distance in Young Children and Adults: a Comparative Study," University of Iowa Studies in Child Welfare 4, No. 4, 1930.

100. Valle, Louis D., T.G. Andrews and Sherman Ross. "Perceptual Thresholds of Curvilinearity and Angularity as Functions of Line Length," Journal of Experimental Psychology 51: 343-47, 1956.

101. Van Waters, Ralph O. "Visual Perception of Horizontal Movement," Journal of Experimental Psychology 17: 223-45, 1934.

102. Vernon, M.D. The Psychology of Perception. Harmondsworth, Middlesex: Penquin Books Ltd., 1962.

103. Von Senden, M. Space and Sight. Glencoe, Ill.: The Free Press, 1960.

104. Walchi, Richard M. "The Perception of Velocity," Connecticut College Psychology Journal 1: 19-38, 1964.

105. Walk, R.D., Samuel Trychin and Bernard Z. Karmel. "Depth Perception in the Dark-Reared Rat as a Function of Time in the Dark," Psychonomic Science 3: 9-10, 1965.

106. Weine, Paul and Richard Held. "Changes in Perceived Size of Angles as Function of Orientation in the Frontal Plane," Journal of Experimental Psychology 71: 55-59, 1966.

107. Wenger, M.S., F.N. Jones and M.H. Jones. Physiological Psychology. New York: Holt, Rinehart and Winston, 1956.

108. Wiener, Earl L. "Motion Prediction as a Function of Target Speed and Duration of Presentation," Journal of Applied Psychology 46: 420-24, 1962.

109. Williams, Harriet G. "The Perception of Moving Objects by Children." Unpublished manuscript, University of Toledo, 1967.

110. Wilson, Paul D. and A.H. Reisen. "Visual Development in Rhesus Monkeys Neonatally Deprived of Patterned Light," Journal of Comparative Physiological Psychology 61: 87-95, 1966.

111. Winer, B.J. Statistical Principles in Experimental Design. New York: McGraw-Hill Book Company, 1962.

112. Winograd, Samuel. "The Relationship of Timing and Vision to Baseball Performance," Research Quarterly 13: 481-93, 1942.

113. Wohwill, Joachim. "Developmental Studies of Perception," Psychological Bulletin 57: 249-88, 1960.

114. Wooldridge, Dean E. The Machinery of the Brain. New York: McGraw-Hill Book Company, Inc., 1963.

115. Wooster, M. "Certain Factors in the Development of a New Spatial Coordination," Psychological Monographs 32, No. 4: 146, 1923.

APPENDICES

APPENDIX A

SUBJECT INSTRUCTIONS

Instructions to the subject were as follows:

"We are going to shoot a number of tennis balls from the Tennis-Ball Boy machine which you see here. (Subject was shown the Tennis-Ball Boy machine.) You will only be able to see a part of the flight of each of these balls. (Subject and Experimenter walked back to starting point under the canvas.) Based upon what you see, we want you to decide where you should go in order to catch the ball as you might actch a fly ball if you were playing a game of baseball. Once you have decided where to go, move to that spot, just as though you were actually going to try to catch the ball. Attempt to catch each ball at chest height with the body in an upright position and the arms in close to the body. (Subjects were shown the catching position.) In other words we don't want you to have to reach or stretch in any direction to catch the ball but rather try to position yourself so that you are directly under the ball when you catch it. Do you have any question?"

"You will start each trial from this same point under the canvas. You may stand with either foot on the footpad. (Subject was shown footpad and how to place his foot on it.) At the beginning of each trial, the Experimenter will say 'Ready?' On this signal, you will step onto the footpad and shortly thereafter, the ball will be projected from the machine."

"Stay as relaxed as you can. Watch each ball for as long as you need to to make your decision about where to go to catch it. Try to make this decision just as soon as you can. When you know or think you know where to go, move quickly into position to catch the ball. Once you have reached your 'selected' spot, stay there until you are instructed to go back to your original starting position." Now do you have any questions?"

If the subject had questions, they were clarified. Three prctice trials, using speeds and angles of projection not involved in the study, were then given to each subject to be sure that the subject understood the nature of the task he was to perform. Again any questions which the subject had relating to the performance of the task were answered.

LAFAYETTE DEPTH PERCEPTION APPARATUS*

Description

The apparatus consisted of two rods suspended within an enclosed wooden framework. The adjustance rods could be moved back and forth by manipulating a cord attached to the rod guides. The apparatus was lighted from within to provide uniformly diffused illumination. A centimeter scale located on the top of the apparatus provided the means by which the distance between the two rods was measured.

Procedure

The subject, seated on a chair twenty feet from the depth perception apparatus, was instructed to manipulate the cord until the two black rods in the box appeared to him to be parallel to each other in space. The distance between the two rods was then measured in centimeters. A total of three trials was given. The score was the mean of the three trials.

*Lafayette Instrument Co., Lafayette, Indiana

OVERARM THROW FOR VELOCITY

The subject stands behind a starting line which is 50 feet from the wall (a 30-foot distance was used for the junior high subjects). The subject throws the softball at a wall which is marked horizontally into one foot areas. The time of the throw, from release to contact with the wall, and the height of the wall contact are recorded for each trial. From these data, in addition to knowing the height of the subject, the velocity of the throw is read from a table which was prepared by procedures described by Mortimer (45). The total score for each subject was the average of four trials.

Sample from Velocity Table

DIFFERENCE IN HEIGHT*	TIME Seconds	ANGLE Degrees	VELOCITY Feet/Sec
0	.80	18.93	39.64
0	.81	19.37	39.26
0	.82	19.81	38.88
-2	.66	9.47	46.08
-2	.67	9.86	45.44
-2	.68	10.26	44.83
3	.95	30.27	36.56
3	.96	30.70	36.34
3	.97	31.14	36.13

*Difference in height = difference between subject's height and height of wall contact.

<u>Canvas</u>. The canvas was suspended from a series of large metal volleyball standards placed at ten foot intervals along the length of the canvas on both sides. A system of roped and wire pulleys was devised to enable the canvas to be pulled taut at the desired ten-foot height.

Rotatory Platform. Heavy metal braces were placed on the underside of the platform in such a way as to allow the machine to be rotated exactly five degrees to the right and five degrees to the left.

An enlarged protractor was placed on the floor under the pivotal device to confirm the accuracy of the placement of the metal brackets.

DISTRIBUTION OF AVERAGE OF FOUR TRIALS ON THE THROW FOR VELOCITY TEST
(Measured in feet per second)

JUNIOR HIGH

71.26*	62.23	56.76*	53.44*	51.45	49.51	45.21	42.14
69.55	61.04	56.38	53.04	51.27	49.04	44.63	41.99**
67.54	60.45*	56.13	52.96	51.13	47.97	44.63	41.65**
67.23	60.02	55.33	52.89	50.70	47.60	43.86	41.56**
67.14*	59.37	54.35	52.78	50.60	47.39	43.41	40.21**
65.77*	59.24	54.24	52.33	50.58	47.23	42.96**	39.76**
64.17*	58.60	54.10	52.33	50.20	46.51	42.79	37.16
62.75	57.87	54.07	51.82	50.07	46.21	42.68	36.76**
62.73*	57.58	53.77	51.62*	49.55	45.40	42.67	35.58
62.23	56.78	53.53	51.55	49.52	45.32	42.56**	34.42**

HIGH SCHOOL

120.68*	100.15	91.57	87.65	82.22	77.83	71.56	62.44**
115.33*	100.10*	91.46*	87.31	81.34	76.21	71.15	61.90
109.92	99.62	91.30	86.23	81.33	75.77	71.06	56.70**
108.48*	98.68*	90.69	86.21	81.04	75.31	71.03**	55.39**
102.91	96.15	90.26	85.76	80.68	74.35	69.96	53.53
101.07	95.90	90.04	85.68	79.97	73.88	68.93**	52.98
100.88*	94.39	90.00	85.41	79.92	72.75	68.75	52.85
100.38*	93.97	89.67	84.55	79.84	72.45	67.65	52.84**
100.27	93.22	87.97	84.39	79.16	72.15**	64.75**	46.37**
100.15*	92.63	87.66	82.69	78.97	71.68	64.27	

COLLEGE

110.32*	98.11*	79.27	75.99	74.09	71.28	67.76**	61.60**
108.17*	95.86*	79.25	75.19	74.08	70.64**	66.94	59.62**
106.79*	93.72*	79.08	74.84	73.88	69.61	65.50**	51.06**
104.84*	87.99*	78.95	74.54	72.76	69.48	65.40**	45.95**
103.42*	85.49	77.19	74.42	71.85	68.90	65.33	44.11**
102.37	85.14	76.12	74.36	71.62	68.65	65.15	

* High-skilled category

** Low-skilled category

INFORMATION SHEET

Name_______________

Age_______

1. Do you play varsity baseball? Yes____ No_____

2. If yes, what position? ______________________

3. Do you play any sports at the varsity level? Yes ____ No ____

4. If Yes, which ones? List below.
   a. ______________
   b. ______________
   c. ______________
   d. ______________
   e. ______________

5. Do you or have you played softball or baseball in any organized form? (local or community leagues, etc.) Yes ____ No _____

6. If yes, for how many years or seasons? ____________

   What position? ____________

7. What sports or physical activities, if any, are you most active in?
   a. ______________
   b. ______________
   c. ______________
   d. ______________
   e. ______________

CHARACTERISTICS OF SELECTED SUBJECTS

SUBJ. NO.	AGE	HEIGHT	VISUAL ACUITY	DEPTH PERCEP-TION	AVE. VELO-CITY
0111	12	4'10"	20/20	-3.0	65.77
0211	13	5' 2"	20/40	3.6	67.14
0311	13	5' 2"	20/20	2.8	51.62
0411	13	5'11"	20/25	1.5	62.73
0511	13	5' 4"	20/20	1.6	64.17
0611	13	5' 2"	20/20	3.6	53.44
0711	13	5' 8"	20/20	1.6	56.76
0811	12	5' 5"	20/20	-4.6	71.26
0911	12	5' 4"	20/40	2.8	60.45
1012	13	5' 6"	20/20	1.8	41.65
1112	13	5' 0"	20/25	1.8	34.42
1212	13	5' 6"	20/20	4.2	36.76
1312	13	6' 0"	20/25	3.5	41.99
1412	12	5' 0"	20/20	3.0	41.56
1512	13	5' 6"	20/20	3.7	39.76
1612	13	5' 1"	20/20	1.4	42.56
1712	12	4' 6"	20/25	.8	40.21
1812	13	5' 4"	20/20	1.9	42.96
1921	15	5' 8"	20/25	3.8	100.38
2021	16	5' 9"	20/20	2.0	100.10
2121	15	5' 7"	20/20	0	115.33
2221	15	5' 8"	20/20	3.8	98.68
2321	15	5' 7"	20/30	4.1	108.48
2421	16	5' 9"	20/30	2.6	91.46
2521	15	6' 0"	20/25	2.2	120.68
2621	16	5' 9"	20/20	3.4	100.88
2721	16	5' 8"	20/25	1.2	100.15
2822	15	6' 1"	20/30	2.0	71.03
2922	15	5' 5"	20/40	3.5	72.15
3022	17	5' 8"	20/40	.8	52.84
3122	16	5' 7"	20/20	2.5	68.93
3222	15	5' 5"	20/20	4.9	64.75
3322	16	5' 8"	20/30	3.1	56.70
3422	16	5' 3"	20/40	1.7	46.37
3522	16	5' 9"	20/30	2.1	55.39
3622	16	5' 6"	20/30	1.1	62.44
3731	20	5' 7"	20/20	4.4	95.86
3831	19	6' 0"	20/20	1.7	93.72
3931	20	5'11"	20/20	1.1	97.98
4031	21	6' 1"	20/20	3.5	104.84
4131	19	6' 1"	20/20	1.8	103.42
4231	21	5'11"	20/20	3.5	98.11
4331	20	5'11"	20/20	.8	106.79
4431	19	5' 9"	20/20	2.4	108.17
4531	19	5' 8"	20/20	2.1	110.32

CHARACTERISTICS OF SELECTED SUBJECTS (CONT'D)

SUBJ. NO.	AGE	HEIGHT	VISUAL ACUITY	DEPTH PERCEP- TION	AVE. VELO- CITY
4632	19	5' 9"	20/20	-2.4	65.50
4732	20	6' 0"	20/20	3.1	51.06
4832	18	6' 0"	20/20	3.9	67.76
4932	18	5'10"	20/20	1.1	70.64
5032	18	5'11"	20/20	2.1	65.15
5132	19	6' 0"	20/20	2.5	44.11
5232	18	5' 4"	20/20	4.1	65.40
5332	19	5' 9"	20/20	2.1	59.62
5432	18	6' 0"	20/20	1.0	45.95

APPENDIX E

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS

Subject 0111		Subject 0211		Subject 0311		Subject 0411	
F-C-H	S-L-H	S-C-L	S-R-H	S-R-L	S-L-L	S-L-L	F-C-H
S-L-H	S-R-H	F-L-L	S-C-H	F-C-H	S-L-H	S-R-L	F-R-H
F-L-L	F-L-H	S-R-L	F-C-L	S-C-H	S-R-L	S-L-H	S-C-H
S-L-H	F-R-L	S-C-H	S-L-L	F-C-L	F-R-L	S-R-H	F-L-H
F-C-L	S-L-H	F-C-H	F-R-L	S-C-L	F-R-L	S-C-H	F-L-H
S-R-L	S-L-L	F-R-H	F-L-L	S-R-H	F-C-L	F-L-H	S-L-L
S-R-H	F-C-H	S-L-L	S-C-L	F-L-L	S-R-H	S-R-L	S-C-H
S-C-L	F-R-L	S-R-L	S-C-H	F-R-H	S-R-L	S-R-L	F-R-H
F-L-L	S-L-H	S-L-H	S-L-L	S-L-L	F-C-H	F-C-H	F-R-L
S-R-L	F-R-H	S-R-H	S-L-L	F-R-L	F-R-H	F-L-L	S-R-L
F-C-L	F-L-L	F-L-H	S-L-H	S-L-H	S-C-L	S-L-L	F-C-H
F-C-L	F-C-H	S-L-H	S-C-L	S-C-L	S-C-L	F-R-H	S-R-H
S-C-H	S-R-H	F-L-L	F-C-L	S-C-L	F-C-H	S-C-L	F-R-L
S-R-H	F-R-H	F-C-H	F-R-L	F-C-H	S-R-H	F-L-L	S-R-L
F-L-H	F-L-H	S-C-L	S-R-H	S-R-L	F-C-H	S-R-H	F-L-H
F-R-L	S-C-H	S-L-H	S-C-L	S-C-H	S-C-H	F-C-L	F-L-L
F-L-H	F-R-L	F-C-L	F-R-L	F-C-L	S-L-H	F-R-L	S-C-L
F-C-H	F-L-L	S-R-H	F-C-L	F-L-H	F-L-L	F-C-H	F-C-L
S-L-L	F-R-H	F-C-H	S-R-L	S-R-H	S-R-H	F-R-L	S-R-H
S-L-L	S-L-L	F-R-L	F-R-L	F-L-H	S-L-H	F-L-H	F-C-H
F-R-H	S-L-H	F-C-L	S-C-L	F-L-L	F-R-L	S-C-L	F-L-L
F-R-H	S-R-L	F-L-H	S-L-L	S-C-H	F-C-L	S-L-H	F-C-L
S-L-L	S-C-L	S-L-L	F-R-H	S-L-L	F-R-L	F-C-L	S-L-L
S-C-H	F-L-H	F-L-H	F-L-H	S-R-L	S-C-H	S-C-H	F-R-L
S-C-L	F-C-H	S-C-H	F-R-H	S-L-L	S-L-H	S-C-L	S-R-L
F-L-L	S-R-L	S-R-L	S-L-H	S-L-H	F-R-H	F-R-L	F-C-H
S-C-L	F-R-H	S-C-L	F-R-H	S-L-H	S-L-L	S-R-L	S-L-L
F-R-L	S-L-L	F-R-H	S-L-H	S-C-L	S-R-L	S-L-L	S-L-L
F-L-H	F-L-H	F-R-L	F-R-H	S-R-H	F-C-L	F-R-H	S-C-H
S-L-L	S-L-L	F-L-L	F-C-L	S-C-H	S-C-L	F-C-H	F-C-H
F-R-L	S-R-L	F-L-L	F-R-H	F-L-H	F-R-H	S-L-L	F-L-H
F-C-H	F-C-L	S-C-H	F-R-L	F-R-H	S-C-L	F-C-L	F-R-H
F-C-L	S-R-L	S-L-H	S-L-H	F-R-L	F-R-H	F-C-L	S-R-L
F-L-H	F-L-H	S-R-H	F-L-L	S-R-H	F-L-H	S-C-H	S-R-H
S-R-H	S-R-H	S-C-H	S-R-H	F-C-L	F-L-H	S-L-H	S-C-H
S-R-H	S-C-H	F-R-H	F-L-L	F-L-L	S-C-H	F-R-L	F-R-H
S-C-L	F-R-L	F-C-L	F-C-H	F-R-L	F-L-H	S-L-H	F-C-L
S-C-H	F-R-L	F-L-H	S-R-L	F-R-H	S-C-H	F-L-H	F-C-L
S-L-H	F-C-H	F-C-H	S-R-H	S-R-L	F-L-L	F-L-L	S-C-L
F-R-H	F-C-L	F-R-L	F-C-H	F-R-L	F-C-L	F-R-H	S-C-L
S-R-L	F-L-L	S-R-L	F-C-H	F-C-H	F-L-H	S-C-L	S-L-H
S-L-L	S-R-H	S-L-L	S-C-H	F-R-H	S-L-L	S-R-H	S-R-H
S-L-L	S-C-H	S-C-L	F-L-H	S-L-L	S-R-L	F-L-H	S-L-H
F-L-L	S-C-H	F-C-H	S-R-L	S-L-H	F-L-H	S-R-H	F-L-L

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 0111		Subject 0211		Subject 0311		Subject 0411	
F-C-H	F-C-L	F-C-L	F-L-H	F-C-L	F-L-L	F-L-L	S-L-H
S-L-L	F-C-L	S-L-L	F-L-L	F-C-H	F-L-L	F-R-L	F-L-L
S-L-H	F-L-L	S-C-H	S-R-L	S-L-L	S-R-H	S-L-H	F-L-H
S-R-L	S-C-H	S-R-H	F-L-H	F-C-H	F-L-L	S-C-L	S-C-H

Subject 0511		Subject 0611		Subject 0711		Subject 0811	
F-R-L	S-L-L	S-R-L	F-R-L	S-C-H	F-R-L	F-R-L	F-R-L
S-R-L	S-R-L	S-R-L	F-L-H	S-C-L	S-R-L	S-C-L	F-C-H
F-C-L	F-R-H	F-C-L	F-R-H	F-L-L	S-L-H	F-R-H	F-C-H
F-R-L	S-R-L	S-C-H	S-L-H	F-L-H	F-R-L	S-L-H	S-L-H
S-R-H	S-L-H	F-C-H	S-C-H	S-L-L	S-C-H	F-R-L	F-C-H
F-L-L	S-L-H	F-L-L	S-C-L	S-L-H	S-R-H	S-C-L	F-L-H
F-C-L	S-L-L	S-L-L	F-C-H	S-C-L	F-R-L	S-C-H	S-L-H
S-L-H	S-L-H	F-L-L	F-L-H	F-R-L	F-C-H	S-L-L	S-C-L
S-C-H	F-R-L	F-C-H	S-L-H	S-C-L	F-C-H	F-C-L	S-L-H
F-C-H	F-R-L	S-R-L	S-R-L	F-R-H	S-R-L	F-R-H	F-L-H
F-R-H	F-C-L	F-R-L	S-L-L	S-R-L	F-R-H	S-R-L	S-C-L
S-L-L	F-C-H	S-L-H	F-R-H	F-C-L	F-C-L	S-C-H	F-C-L
F-L-H	F-C-H	F-R-H	F-R-H	S-R-H	S-C-H	F-C-H	S-L-L
F-C-H	S-C-L	S-R-H	F-R-H	S-C-H	F-C-H	F-L-L	S-L-L
F-R-H	F-R-L	S-R-H	F-L-L	F-L-H	S-C-L	F-R-H	S-C-L
S-R-L	F-L-H	F-L-H	F-R-L	F-L-L	S-L-H	F-R-L	S-L-L
S-C-L	S-L-L	S-C-L	S-L-L	F-R-L	S-L-L	F-L-H	F-C-L
S-R-L	S-C-L	F-C-L	S-C-L	F-C-H	S-C-H	S-L-L	S-L-L
S-R-H	F-R-L	S-L-H	S-L-H	F-R-H	F-L-H	S-R-H	F-R-L
F-L-L	S-L-H	F-L-L	S-C-H	S-R-L	S-C-L	F-L-H	S-R-L
S-C-H	F-L-H	S-R-H	S-C-H	S-L-L	F-R-H	F-L-L	S-C-L
S-L-H	S-C-H	S-C-H	F-L-L	S-R-L	F-C-L	S-R-H	S-C-H
F-R-L	F-R-H	F-R-L	S-L-L	F-R-L	S-L-H	F-L-L	F-L-H
F-L-H	S-L-L	F-L-H	F-C-H	F-L-L	S-C-L	S-L-L	S-R-H
F-L-L	S-R-L	S-R-H	S-C-L	F-R-H	S-R-H	S-R-L	S-C-H
F-C-L	S-L-H	F-R-H	S-C-H	F-C-H	F-R-H	S-C-H	F-R-L
S-C-L	F-R-H	S-R-L	S-R-H	S-L-L	F-C-L	S-R-L	S-C-H
S-L-L	F-R-H	F-L-L	F-C-L	F-C-L	S-L-H	F-C-H	F-R-L
F-R-H	S-C-H	F-C-L	F-C-H	S-C-H	F-L-H	S-L-L	F-R-H
S-C-H	F-C-H	S-C-L	S-R-H	S-L-H	F-C-L	F-R-H	F-R-H
F-R-L	F-C-H	F-L-H	F-C-L	F-C-H	F-L-H	F-C-H	S-R-L
S-R-L	F-L-L	S-L-H	S-R-L	F-R-L	F-L-H	F-L-H	F-R-H
S-R-H	S-C-H	S-C-H	F-C-L	F-C-L	F-R-H	S-R-H	S-C-H
S-R-H	S-C-H	F-R-L	F-L-H	S-C-L	S-C-H	F-L-L	F-C-L
S-C-H	S-R-L	S-L-L	S-L-L	F-L-L	S-R-L	S-R-L	F-C-L
F-C-H	S-R-H	F-C-H	F-C-L	S-L-L	F-L-L	S-L-H	S-R-L
S-L-L	F-L-H	S-C-L	F-L-L	S-R-L	F-L-L	S-L-H	F-L-L
F-L-H	S-R-H	S-L-L	F-C-H	S-R-H	F-C-L	S-C-L	F-L-H
S-L-H	S-C-L	F-R-H	S-C-L	F-C-H	S-R-L	S-L-H	S-C-L

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 0511		Subject 0611		Subject 0711		Subject 0811	
F-L-H	S-C-L	F-C-L	F-L-L	F-L-H	F-L-L	F-C-L	F-L-L
F-L-L	F-L-L	F-R-L	S-R-H	S-R-H	S-R-H	F-R-L	S-R-H
S-C-L	F-L-L	S-C-L	S-R-H	S-L-H	F-L-H	F-C-L	S-R-L
F-R-H	S-R-H	F-R-L	F-C-H	S-L-H	S-R-H	S-L-H	F-L-L
F-C-L	S-R-H	S-L-L	F-L-H	S-C-L	S-L-L	F-C-H	S-R-H
F-C-L	F-L-L	F-R-L	F-L-H	F-C-H	S-L-L	S-C-H	S-R-H
F-L-H	S-C-L	S-L-H	S-R-L	F-R-L	S-L-L	F-R-H	F-L-L
F-C-L	F-C-L	F-R-H	S-R-L	S-C-H	S-R-H	F-L-H	S-R-H
F-C-H	S-L-L	S-L-H	S-C-H	F-R-H	F-L-L	F-C-L	F-C-H

Subject 0911		Subject 1012		Subject 1112		Subject 1212	
S-C-L	S-C-H	F-R-H	F-C-L	F-R-L	S-R-L	S-R-L	S-C-L
S-L-L	S-L-H	F-L-H	S-C-L	F-C-H	F-C-H	S-L-H	S-C-H
F-R-H	F-R-L	S-R-L	S-C-H	F-R-L	F-C-H	F-C-H	F-R-H
F-R-H	F-C-L	S-L-L	S-C-H	S-R-L	F-C-H	S-L-L	S-L-L
F-L-L	S-R-L	F-L-L	F-R-H	F-R-L	S-R-L	S-R-L	S-R-L
S-C-H	S-C-L	S-R-H	F-R-L	F-R-L	F-C-L	F-C-L	S-L-H
F-R-L	F-C-L	F-C-H	F-L-L	S-C-L	S-L-L	F-L-L	F-R-H
S-R-L	F-R-L	S-C-L	F-R-L	S-C-L	F-C-L	F-R-H	S-L-L
F-C-H	S-C-L	F-R-L	F-R-H	S-L-H	F-C-H	F-C-H	S-R-L
S-L-H	S-R-L	F-R-H	S-L-H	F-R-L	F-C-H	S-C-L	S-R-H
S-C-H	S-R-L	F-C-L	S-R-L	F-L-L	S-R-L	F-L-L	S-C-H
F-L-H	S-L-H	S-C-H	F-C-L	S-L-L	S-L-H	S-R-H	F-C-L
F-L-H	S-C-H	F-L-H	S-L-L	S-L-H	F-R-H	F-R-L	F-L-H
F-C-L	S-C-L	F-L-H	F-C-L	F-L-H	F-R-L	F-R-H	F-L-L
S-R-H	F-R-H	F-R-L	F-R-H	S-L-H	F-L-L	F-L-L	F-L-H
S-R-H	S-C-H	S-L-L	S-L-L	S-C-L	S-L-H	F-C-L	S-C-H
S-C-L	S-R-L	S-R-L	S-C-H	S-C-L	F-R-H	F-L-H	F-R-H
F-L-H	S-C-H	F-C-H	F-L-H	S-C-H	S-C-H	S-C-H	S-L-L
S-L-L	F-C-L	S-L-L	F-C-L	F-C-L	F-L-L	S-R-H	S-C-L
F-R-L	S-L-H	S-C-H	S-L-L	F-R-H	F-C-L	S-L-H	F-C-L
F-R-H	F-C-H	S-L-H	F-L-L	F-L-L	S-L-L	S-R-H	F-C-L
S-L-H	F-L-H	S-C-L	S-L-H	S-R-L	S-C-H	S-R-L	S-C-L
S-L-H	F-C-L	S-R-L	S-C-H	F-R-H	S-R-H	F-R-L	S-C-H
S-R-L	F-R-L	S-L-H	S-L-L	F-C-L	F-L-H	S-C-H	S-C-L
S-R-H	F-L-H	S-C-L	S-C-L	S-R-H	F-L-H	F-R-H	F-L-H
S-C-L	F-R-L	F-L-L	S-L-H	F-C-L	S-R-H	S-L-L	S-L-L
S-C-H	S-L-L	S-C-H	S-C-L	F-L-H	S-C-L	S-C-L	S-C-L
F-C-H	S-L-L	F-R-H	S-C-L	F-L-H	S-L-H	S-R-L	F-C-L
F-L-L	S-L-L	F-C-H	F-L-L	S-L-L	F-C-H	F-L-H	F-C-H
S-L-L	S-C-H	S-L-H	S-L-H	S-L-H	S-R-L	F-R-L	F-C-L
S-L-H	S-R-H	S-L-L	F-C-H	F-L-H	F-R-H	S-C-H	S-R-L
F-C-H	F-R-H	F-C-L	F-R-H	S-C-L	F-R-L	S-L-H	S-C-H
F-C-H	F-C-H	S-C-L	F-L-H	F-C-L	S-C-L	S-L-H	S-L-H
S-R-L	F-R-H	F-C-H	F-R-L	F-L-L	S-L-H	S-R-H	S-R-L

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 0911		Subject 1012		Subject 1112		Subject 1212	
F-C-L	S-L-L	F-L-L	S-R-L	F-L-L	F-C-L	S-C-L	F-L-H
F-R-L	S-R-H	F-R-L	F-C-H	S-C-H	F-R-L	F-L-L	F-C-H
F-C-L	S-C-L	S-R-H	S-R-H	F-R-H	F-L-H	F-R-H	F-R-H
F-R-H	F-C-H	F-C-L	F-C-H	S-C-H	S-C-L	F-C-L	F-L-L
F-L-L	F-C-H	S-R-L	F-C-H	F-R-H	S-C-H	S-L-L	F-C-H
F-L-H	F-C-L	S-R-H	F-L-L	F-L-L	S-L-L	F-R-L	S-L-H
S-R-H	F-L-H	F-L-H	F-L-L	S-L-L	F-L-L	F-C-H	S-R-H
F-L-L	S-R-H	S-R-H	F-L-H	S-L-L	S-R-L	F-L-H	F-R-L
S-R-L	F-L-L	F-R-L	S-R-H	S-R-H	F-R-H	S-L-L	F-R-L
S-R-H	F-L-L	S-L-H	S-C-H	S-R-H	S-R-H	F-L-L	S-R-H
F-R-L	F-L-H	S-R-H	F-L-H	S-C-H	F-L-H	F-R-L	F-C-H
S-L-H	F-L-L	F-R-H	S-R-L	S-R-L	S-C-H	S-L-H	F-L-L
S-C-L	F-L-L	F-C-L	S-R-L	S-R-H	F-C-H	S-R-H	F-R-L
F-R-H	S-L-L	F-R-L	S-R-H	S-R-H	S-L-L	F-L-H	F-C-H

Subject 1312		Subject 1412		Subject 1512		Subject 1612	
S-L-L	F-R-H	S-R-H	F-L-H	S-R-H	F-R-L	F-L-L	S-C-L
S-C-L	F-C-H	F-C-L	S-L-L	S-C-L	S-C-H	S-C-L	S-C-L
F-L-H	S-C-L	F-R-L	F-R-H	F-R-L	F-R-H	F-R-L	S-L-H
F-R-H	F-C-H	F-C-H	F-R-L	F-C-L	F-R-H	F-R-L	S-C-H
S-C-L	S-R-H	F-R-L	S-R-L	F-L-L	F-L-L	F-R-H	S-C-L
F-L-H	S-L-H	F-L-L	F-C-H	S-L-L	S-R-L	F-L-H	S-C-L
S-L-H	F-R-L	F-R-H	S-L-L	S-C-H	S-L-L	S-L-L	F-R-L
S-L-L	S-R-L	F-L-L	S-L-H	F-C-H	F-C-H	F-L-H	S-R-H
S-R-H	S-L-H	S-L-H	S-L-H	F-L-H	S-R-H	S-C-L	F-C-L
S-C-H	F-L-H	F-C-L	S-C-H	F-R-H	S-L-H	F-R-L	S-R-L
F-R-L	S-L-L	S-C-L	F-R-H	S-R-L	F-R-H	S-R-H	F-C-L
F-R-H	F-L-L	F-L-H	S-L-L	S-L-L	S-L-L	F-R-H	F-R-H
F-R-L	S-C-H	S-R-L	F-R-H	S-R-H	S-L-H	F-C-L	S-R-L
F-L-L	S-R-L	S-L-H	S-L-H	S-R-L	S-L-L	F-C-L	S-L-H
S-C-H	F-L-H	S-R-H	S-R-H	F-R-L	S-R-L	F-L-L	F-L-H
F-R-L	F-R-L	S-L-L	F-C-H	F-L-H	F-L-H	S-C-H	F-L-L
F-R-H	S-L-L	F-C-H	S-C-H	F-L-L	S-C-L	S-L-L	S-C-H
S-R-L	S-R-L	S-C-H	F-R-L	S-C-H	F-L-H	S-C-H	S-L-L
F-C-L	S-C-H	S-R-L	S-R-H	S-L-H	S-R-H	S-R-H	F-R-L
S-C-H	S-L-L	F-R-H	S-C-L	F-R-L	F-C-H	S-L-H	S-L-L
S-L-L	S-R-H	F-L-H	S-C-L	S-C-L	F-R-H	F-C-H	F-R-L
S-L-L	F-R-L	S-C-H	S-C-L	F-R-H	F-L-H	S-R-L	F-L-H
F-C-H	F-C-L	F-R-H	F-L-H	F-C-L	S-L-L	F-C-H	S-R-L
S-L-H	F-C-L	S-R-H	F-L-L	F-C-H	S-C-L	F-L-L	F-R-L
F-C-L	S-R-L	S-C-L	F-R-H	S-C-H	F-C-L	S-L-H	F-R-H
F-L-L	F-C-H	F-L-L	F-R-L	S-L-L	S-L-H	F-C-H	S-C-L
F-C-H	F-L-L	F-C-H	F-C-H	F-R-L	S-C-L	S-L-H	S-L-L
F-L-L	F-C-L	S-L-H	F-C-L	F-C-L	F-R-L	S-R-H	S-L-H
S-R-L	S-L-H	F-R-L	S-C-L	S-R-L	S-C-H	S-R-L	S-L-H
F-L-L	S-R-H	F-C-L	S-C-H	F-C-L	S-R-L	S-C-H	F-R-H

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 1312		Subject 1412		Subject 1512		Subject 1612	
S-L-H	S-C-L	S-C-L	S-R-L	F-L-L	F-C-L	S-R-H	S-L-L
S-C-L	F-C-L	S-L-L	F-L-L	S-R-H	F-C-L	S-L-H	F-C-H
F-C-L	F-L-H	S-L-L	F-R-L	S-L-H	F-L-L	S-C-L	F-L-L
F-L-H	F-R-H	F-R-H	S-R-H	F-C-H	F-C-L	F-C-L	F-R-H
F-R-L	S-C-L	F-L-H	S-R-L	S-C-L	F-C-H	F-L-H	S-R-L
F-C-H	S-R-L	F-L-L	F-C-L	F-R-H	F-C-H	S-L-L	S-C-H
F-R-H	S-L-L	S-R-L	F-L-H	S-C-H	F-L-H	F-L-L	F-C-H
S-R-L	S-C-H	S-L-H	S-R-H	F-L-L	S-L-H	F-C-L	F-C-H
S-R-H	F-C-H	F-R-L	F-L-H	F-L-H	S-R-L	S-R-L	S-R-H
S-R-H	F-L-L	F-C-H	F-L-L	S-C-L	F-R-L	S-C-H	S-R-L
S-C-H	S-C-H	S-C-H	S-R-L	S-L-H	F-C-H	F-R-H	F-C-H
F-L-H	S-R-H	S-L-L	F-C-L	S-R-L	S-C-H	F-R-L	S-R-H
S-L-L	F-R-H	S-L-H	F-L-L	S-R-H	F-R-L	F-R-H	F-L-H
F-C-H	F-L-L	S-R-L	F-C-L	S-L-L	S-L-H	S-L-L	F-L-H
F-L-H	S-R-H	S-C-H	S-R-H	S-C-H	F-L-L	F-L-L	F-L-L
F-R-L	F-R-H	F-C-H	F-C-L	F-L-H	S-R-H	F-C-L	S-C-H
S-L-H	F-C-L	S-L-L	S-C-H	F-R-H	F-L-L	S-R-H	F-L-L
S-C-L	S-C-L	S-C-L	F-L-H	S-C-H	S-R-H	F-L-H	F-C-H

Subject 1712		Subject 1812		Subject 1921		Subject 2021	
S-L-L	F-C-L	F-C-L	S-L-H	F-R-L	F-C-H	S-R-L	S-L-L
F-L-L	F-R-L	S-C-L	F-R-H	S-L-L	F-R-H	F-R-L	S-L-L
F-C-H	F-C-H	F-C-L	F-R-L	S-C-L	F-R-L	S-C-H	S-C-H
S-L-L	S-L-H	S-R-L	F-R-L	F-R-L	S-C-L	F-L-L	F-C-H
F-R-L	S-L-H	F-C-H	F-C-L	F-R-H	S-L-H	F-R-H	F-R-L
F-L-H	F-L-L	S-C-H	F-R-L	F-C-L	S-R-L	S-L-H	F-C-L
F-R-L	F-R-L	S-L-H	F-R-L	F-C-H	S-C-L	S-R-L	S-C-H
S-R-H	F-C-L	F-C-H	S-L-L	S-L-L	S-C-H	S-R-H	S-R-H
S-C-L	S-R-H	S-R-H	F-C-H	S-L-H	S-L-H	F-C-L	F-L-H
F-R-H	S-L-L	S-L-L	S-C-L	F-C-H	S-C-L	F-L-L	F-R-H
F-C-L	S-R-H	F-L-L	S-L-H	F-L-H	F-C-H	S-C-L	F-R-H
F-R-L	S-C-L	S-R-H	S-C-L	F-R-L	F-R-L	F-L-H	S-L-H
S-L-H	S-L-L	F-L-L	S-C-L	S-C-L	S-C-L	F-C-H	F-L-L
F-L-H	F-L-H	F-C-L	F-C-L	S-R-H	F-R-H	S-L-H	F-L-L
F-L-L	F-R-L	F-R-L	F-C-H	F-R-H	F-C-H	S-R-H	F-R-L
F-R-H	F-R-L	S-L-H	F-R-H	S-C-H	S-C-H	F-L-L	S-C-H
F-C-L	S-C-H	F-R-H	F-C-L	S-R-L	S-R-H	S-L-L	F-C-L
S-C-L	F-R-H	S-C-L	F-R-H	S-C-H	S-C-H	F-C-H	F-C-L
S-C-H	F-L-L	F-C-H	F-R-H	F-L-H	S-R-H	F-R-L	F-R-H
S-R-L	S-R-L	S-R-L	S-R-L	F-C-L	S-R-L	F-C-L	F-L-H
S-C-H	S-R-L	F-L-H	F-L-L	F-L-L	S-L-H	S-L-L	S-C-L
F-L-L	F-L-H	S-C-H	S-L-L	S-R-L	F-R-L	S-C-H	F-L-L
F-C-L	S-L-L	S-C-H	F-L-H	F-R-H	F-L-H	F-C-H	S-C-H
S-R-H	S-C-L	S-L-L	S-R-L	S-L-H	F-R-H	F-C-L	S-L-L
S-R-L	S-L-H	F-R-L	S-C-H	F-L-L	F-C-H	S-R-L	S-C-L

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 1712		Subject 1812		Subject 1921		Subject 2021	
F-R-H	S-L-H	S-C-L	S-C-H	F-L-L	S-L-L	F-L-H	S-L-L
F-R-L	S-C-H	F-R-L	F-L-L	S-R-L	S-L-L	F-R-L	F-C-H
S-L-H	S-C-H	S-C-H	F-C-L	S-C-H	F-L-L	S-C-L	S-R-H
S-C-L	S-C-H	S-R-L	F-C-H	F-C-H	F-C-L	S-L-L	F-L-H
F-L-H	S-R-H	S-C-L	S-C-H	S-R-H	F-L-L	S-C-H	S-R-H
F-L-L	F-R-H	S-L-L	S-L-L	S-C-L	F-R-H	F-C-L	S-C-L
S-L-L	F-C-H	F-R-H	F-C-H	S-R-H	F-C-L	F-R-L	S-L-H
F-C-L	F-R-H	F-R-H	S-C-H	F-R-H	F-C-L	F-L-H	F-R-L
S-C-L	F-C-H	F-R-L	S-L-L	F-C-L	F-L-H	S-R-L	S-C-L
S-R-H	F-L-L	F-L-L	S-R-L	S-R-L	F-L-H	S-L-H	F-R-L
S-L-H	F-C-H	F-C-L	F-L-H	S-L-H	F-L-L	F-R-H	S-L-H
S-R-L	S-R-H	F-L-L	F-L-H	F-R-L	F-C-L	S-C-L	F-L-H
S-C-H	S-R-H	S-L-H	S-R-L	F-C-L	S-R-H	S-R-H	S-L-H
F-C-H	S-C-H	F-R-H	S-R-H	F-L-H	S-L-H	F-L-H	S-R-H
S-L-L	F-L-L	F-C-H	S-L-L	S-L-L	S-L-L	F-L-L	F-C-H
F-C-H	S-C-L	F-L-H	S-R-L	F-C-H	S-L-L	F-R-H	F-C-H
S-R-L	F-L-H	F-L-H	S-R-H	S-R-H	S-R-L	S-C-L	S-R-L
F-C-L	S-R-L	F-L-H	S-L-H	F-L-L	S-L-L	S-C-H	S-R-L
F-R-H	S-L-L	S-R-H	S-L-H	F-L-H	S-R-H	S-L-L	S-R-L
F-R-H	S-R-L	F-L-H	F-L-L	S-C-H	S-R-L	F-C-L	S-R-L
F-C-L	S-C-L	S-L-L	F-L-L	F-R-L	F-L-L	S-L-H	F-C-H
F-L-H	F-L-H	S-C-L	S-R-H	S-C-H	F-L-H	F-R-H	S-R-H
S-L-H	F-C-H	S-L-H	S-R-H	S-L-H	S-C-L	F-L-L	F-R-H

Subject 2121		Subject 2221		Subject 2321		Subject 2421	
F-L-L	F-L-L	F-R-L	F-L-H	F-C-L	F-R-L	F-R-L	F-C-H
F-C-H	S-L-H	S-R-L	S-R-H	S-L-H	S-C-H	S-R-L	F-R-H
S-C-L	F-R-L	F-L-H	S-L-L	S-R-H	F-R-L	F-R-H	S-C-H
F-L-L	S-R-L	F-R-H	F-R-H	S-C-L	S-R-L	S-C-L	F-C-L
F-C-H	F-L-H	F-L-L	S-L-H	F-R-L	S-L-L	F-R-L	F-C-H
S-R-L	F-R-L	S-C-L	S-C-L	F-C-H	F-L-H	S-C-H	S-C-L
S-R-L	S-C-L	F-C-L	S-R-H	S-R-L	S-C-L	S-R-H	S-R-L
F-R-H	S-L-L	F-R-L	F-R-L	S-L-H	F-C-H	F-R-H	F-C-H
S-R-L	S-L-H	F-R-H	F-R-L	F-C-L	S-C-L	F-C-L	S-C-L
S-L-H	F-C-L	S-R-H	S-L-H	F-L-L	S-L-H	S-L-L	S-L-L
S-L-H	S-C-H	S-L-L	F-C-H	S-R-H	F-C-L	F-L-H	S-C-H
S-L-L	S-L-L	S-C-H	F-C-L	F-L-L	F-C-L	F-L-H	F-R-H
S-C-L	S-L-L	S-R-L	S-L-H	F-L-H	S-R-L	S-C-L	F-R-L
S-C-H	F-C-H	S-C-H	F-C-L	S-L-H	F-C-H	S-L-H	S-C-H
F-C-L	S-C-H	F-L-H	F-R-L	S-C-H	F-R-H	F-L-L	F-R-H
F-C-L	S-L-H	S-L-H	S-L-L	S-R-H	S-C-H	S-C-H	F-C-L
S-R-H	F-L-H	F-C-H	S-L-L	S-R-L	F-C-H	S-L-L	S-C-L
S-R-H	F-R-L	S-C-L	F-R-L	S-L-L	S-L-H	F-C-H	S-R-L
F-L-H	F-C-L	S-L-L	S-C-H	F-R-H	S-L-H	S-R-H	F-R-H
F-R-L	F-C-H	S-C-H	S-L-L	F-C-H	S-L-L	S-R-L	F-L-L

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 2121		Subject 2221		Subject 2321		Subject 2421	
F-R-L	S-C-L	S-L-L	F-R-H	F-L-L	F-C-H	S-R-L	F-C-H
S-C-H	F-R-L	F-R-L	F-L-L	F-L-H	F-L-H	S-R-L	F-R-L
S-C-L	F-L-L	F-C-H	F-L-L	F-R-L	F-R-H	S-C-H	F-C-L
S-C-H	S-C-L	F-C-L	F-L-H	F-L-H	F-C-L	F-C-H	F-C-H
S-R-L	S-R-H	F-C-L	F-R-H	S-L-L	F-L-H	S-C-H	F-L-L
F-L-H	F-L-L	F-C-H	S-C-L	F-R-H	S-L-L	S-R-H	F-R-L
S-R-H	F-C-L	F-R-L	S-R-H	F-C-L	F-R-H	F-C-L	F-R-L
F-R-L	S-L-H	F-L-H	S-C-L	F-L-L	S-L-L	F-L-L	F-L-H
S-L-H	F-C-L	F-R-H	S-C-H	S-C-H	S-C-L	F-L-L	S-L-L
S-L-L	F-C-L	S-C-L	F-R-H	S-C-L	F-C-L	F-R-H	F-L-H
F-C-L	S-C-H	S-R-H	F-C-L	S-R-H	S-R-H	S-L-H	S-R-L
S-L-L	F-L-H	S-C-L	S-L-H	S-L-H	S-C-L	F-C-L	S-R-H
S-C-L	S-R-L	F-L-L	S-C-L	S-C-L	F-L-H	S-L-H	S-R-L
F-C-H	F-R-H	S-R-H	S-R-H	F-L-H	S-R-L	S-R-H	S-L-L
F-R-H	F-L-H	S-L-H	F-L-L	F-R-H	S-C-H	F-R-L	S-R-H
F-L-L	S-C-L	S-R-L	S-C-H	F-R-L	F-R-L	F-L-H	F-L-L
F-L-H	F-L-H	S-L-H	F-C-L	S-C-H	S-R-H	F-R-L	S-L-H
S-L-H	S-R-L	F-L-L	S-R-L	F-C-H	S-R-H	S-L-H	F-L-L
F-R-H	S-R-L	S-R-L	F-C-L	F-R-L	F-R-H	F-C-H	S-R-H
S-R-H	F-L-L	F-L-L	F-C-H	S-L-L	S-R-H	S-L-L	S-L-H
F-L-L	S-R-H	S-L-H	S-R-L	S-R-L	F-R-L	S-C-L	F-C-L
F-L-H	S-R-H	F-R-H	F-L-H	S-C-H	F-L-L	F-L-H	F-C-L
F-C-H	F-R-H	F-C-H	F-L-H	F-C-H	S-L-H	S-C-H	S-L-H
F-R-H	F-R-H	F-C-H	S-R-L	S-C-H	S-L-L	S-L-L	S-L-H
S-L-L	S-C-H	S-C-H	F-L-H	S-R-L	F-L-L	S-C-L	F-L-H
F-C-H	S-C-H	F-L-L	S-R-L	F-C-L	S-C-L	F-R-H	S-R-H
S-R-H	F-C-H	S-L-L	S-R-H	S-R-L	F-L-L	F-L-L	F-L-H
S-L-L	F-L-L	F-C-H	S-C-H	F-L-L	F-R-H	S-C-L	S-L-L

Subject 2521		Subject 2621		Subject 2721		Subject 2822	
F-C-H	F-C-H	S-L-L	F-R-H	F-L-L	F-L-H	F-R-L	F-C-L
F-L-L	F-L-L	S-C-H	F-L-L	F-L-L	S-L-L	F-R-L	F-C-L
F-R-L	S-C-L	S-R-L	F-L-H	F-C-L	S-C-L	F-L-H	S-R-L
S-L-H	S-R-L	F-L-H	F-C-H	S-L-H	S-L-H	S-C-H	F-C-L
S-C-L	F-L-H	F-R-H	F-R-H	F-R-H	S-C-H	F-R-H	S-L-H
S-R-H	S-R-H	F-L-H	F-R-L	F-R-L	F-L-L	S-R-H	S-L-H
F-C-L	S-C-H	F-R-L	S-C-H	F-L-L	S-L-L	F-L-L	S-L-L
S-R-L	S-C-H	S-C-L	S-R-H	F-R-L	S-C-L	S-C-L	S-C-L
F-R-H	S-L-H	F-R-H	F-R-L	S-C-L	S-L-L	S-C-L	F-L-H
F-R-L	F-L-H	S-C-L	F-C-H	F-C-H	S-L-H	F-C-L.	F-R-L
S-L-L	F-C-H	S-L-H	F-R-H	S-L-H	F-L-L	F-R-L	S-C-H
S-L-H	S-L-H	S-C-H	S-L-L	S-L-L	S-C-H	S-L-L'	F-C-H
F-R-H	F-L-L	S-R-L	F-R-L	S-C-H	F-C-L	S-L-H	F-R-L
F-C-L	F-R-H	S-R-H	F-C-L	F-C-L	S-C-H	F-C-H	S-C-H
F-L-H	F-L-H	S-L-L	F-L-H	S-R-H	S-L-H	S-C-L	S-C-H
S-R-H	S-C-L	F-L-L	F-L-L	S-R-L	S-R-L	F-R-H	F-C-L
F-L-L	F-C-L	F-R-H	F-R-H	S-L-H	S-L-H	F-L-H	S-R-L

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 2521		Subject 2621		Subject 2721		Subject 2822	
F-C-H	F-C-L	F-C-H	S-C-H	F-C-H	S-R-L	S-R-L	F-C-H
S-C-H	S-C-L	F-R-L	S-C-H	F-L-H	F-L-H	S-L-L	S-L-H
S-R-L	F-L-L	F-C-L	S-L-H	S-R-H	S-C-H	S-C-H	S-C-L
S-C-H	S-C-L	F-C-H	F-C-H	S-C-H	S-R-H	S-R-H	S-L-L
F-R-L	F-L-H	S-R-H	S-C-L	S-R-L	S-R-H	F-C-L	S-L-L
S-R-L	S-C-H	S-L-L	S-C-H	F-C-L	F-L-H	S-R-L	S-R-L
S-R-L	F-R-L	F-C-H	F-C-L	F-L-L	F-R-L	F-C-L	S-R-H
F-C-L	S-L-H	F-L-L	F-C-L	F-C-L	F-R-L	S-L-H	F-L-H
S-C-L	F-C-H	S-L-H	S-L-L	F-R-H	S-R-L	S-R-H	S-C-L
F-L-H	S-L-H	S-L-L	S-R-L	S-R-H	F-R-H	F-L-L	S-C-H
S-C-H	F-L-L	F-C-L	S-L-L	F-R-L	F-C-L	F-R-H	S-L-L
S-R-H	F-R-L	F-L-L	S-L-H	S-R-L	S-C-L	S-C-H	F-R-L
S-L-H	S-R-L	F-R-H	S-R-L	S-L-H	S-R-L	S-C-L	S-L-H
S-L-H	F-C-H	S-R-H	S-C-H	F-R-H	F-R-H	F-R-L	S-R-H
S-R-H	F-C-L	F-C-L	F-C-L	F-C-H	F-R-L	F-L-H	F-R-L
F-L-H	S-R-H	S-L-H	S-L-H	S-C-H	F-L-H	F-L-L	F-R-H
F-R-H	F-C-L	S-C-L	S-R-H	F-R-L	F-L-L	S-L-H	F-R-H
S-L-L	F-R-L	F-C-L	S-L-L	S-L-L	F-L-L	S-L-H	F-L-L
F-R-L	S-R-L	S-C-L	S-R-L	S-C-L	F-C-H	S-C-H	F-R-H
S-C-L	S-L-L	S-R-L	S-L-H	F-R-H	F-C-H	F-C-H	F-C-H
F-C-H	S-R-L	S-R-L	S-C-L	F-L-H	S-C-L	S-R-L	F-L-L
F-C-L	S-L-L	S-C-H	F-L-H	S-L-L	F-C-L	S-R-H	F-C-H
F-L-L	S-R-H	F-L-H	S-R-H	F-L-H	S-R-H	S-L-L	S-R-L
S-L-L	F-C-H	F-R-L	F-L-L	S-C-H	S-R-H	F-C-H	F-C-H
F-R-H	S-R-H	F-L-L	F-L-H	S-C-L	F-C-H	F-C-L	S-R-H
F-R-H	F-R-L	F-L-H	S-R-L	F-L-H	F-C-L	F-R-H	S-R-H
S-C-L	F-L-H	S-C-L	S-C-L	F-R-L	S-R-H	F-L-H	F-L-H
S-C-H	S-L-L	F-R-L	S-R-H	F-R-H	F-C-H	S-R-L	F-L-L
F-R-H	S-L-L	F-C-H	S-R-H	F-R-H	S-L-L	F-R-H	F-L-L
S-C-L	F-L-L	S-L-H	F-L-L	S-R-L	F-C-H	S-C-L	F-L-H
F-R-H	S-L-L	F-C-H	F-R-L	S-C-L	S-L-L	S-L-L	F-L-L

Subject 2922		Subject 3022		Subject 3122		Subject 3222	
S-L-H	S-R-H	F-C-H	S-R-H	F-C-L	S-C-H	S-R-H	S-C-H
S-L-L	S-R-L	S-R-L	F-R-H	S-R-H	F-C-L	F-R-L	F-R-L
S-R-L	F-C-L	F-C-L	F-C-L	S-R-H	S-R-L	S-L-H	S-L-L
S-C-H	F-R-H	F-L-L	S-C-H	F-R-L	S-C-H	S-L-H	S-L-L
S-C-L	S-R-H	S-R-L	F-C-H	F-C-L	S-C-L	F-L-L	F-R-H
F-C-H	S-L-H	S-L-H	S-L-H	S-L-H	F-C-H	S-R-L	F-C-L
S-L-L	F-C-L	F-R-L	S-L-H	F-L-L	S-C-H	F-C-L	F-R-L
F-C-H	S-R-L	S-L-L	S-C-H	S-R-H	F-C-H	S-R-H	S-L-H
S-R-L	S-L-H	F-L-L	F-R-L	S-R-H	S-C-H	F-C-H	S-R-L
S-L-H	F-R-L	S-C-H	F-L-L	F-C-L	F-R-L	F-C-H	S-L-L
F-C-L	S-L-H	S-C-L	F-R-H	F-L-H	F-C-H	F-C-L	S-L-L
F-L-L	S-C-H	S-R-H	F-C-H	S-R-L	S-R-L	F-L-L	S-L-H

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 2922		Subject 3022		Subject 3122		Subject 3222	
S-R-L	S-L-L	S-L-L	S-L-L	S-C-H	S-R-H	S-R-L	F-C-L
F-R-L	F-R-L	S-L-H	F-C-H	S-L-H	S-L-H	F-L-H	S-R-H
F-L-H	F-R-L	F-R-L	F-R-H	F-R-L	S-L-L	F-L-L	F-C-H
F-R-H	S-R-H	F-R-H	F-R-L	F-L-L	F-C-L	S-C-L	F-R-L
S-R-H	S-L-L	F-C-H	F-L-H	F-C-H	S-L-L	S-C-H	S-C-H
F-C-H	S-L-H	F-C-L	F-L-H	F-R-H	F-C-L	F-R-L	F-L-H
F-C-L	F-L-H	F-L-L	S-L-L	S-L-H	F-C-L	F-R-H	S-R-H
F-L-H	S-L-H	S-R-L	S-L-H	S-L-L	F-L-H	S-L-L	S-C-H
S-R-H	F-R-H	F-L-H	F-R-L	S-C-L	F-L-H	S-C-H	F-C-L
F-L-L	F-L-L	S-R-H	S-L-H	S-C-H	S-R-L	S-L-L	F-C-L
F-C-L	S-L-L	S-L-L	S-R-H	F-C-L	F-L-L	F-L-H	F-C-L
S-C-L	S-C-L	S-C-L	S-L-L	F-L-H	S-R-H	S-C-H	F-R-L
F-C-H	F-C-H	S-C-L	S-C-L	F-L-L	S-L-H	S-C-L	F-L-L
F-R-H	S-C-H	S-L-H	S-C-L	S-L-L	S-L-L	F-L-H	S-L-H
S-L-H	S-C-H	F-R-L	F-L-L	S-C-L	S-C-L	S-L-L	F-L-H
S-L-L	F-L-H	F-R-H	F-C-H	F-R-L	F-R-L	S-R-H	F-R-H
S-R-H	S-C-H	F-L-L	F-R-H	S-C-H	S-L-H	F-R-L	F-L-H
F-R-L	F-R-L	F-L-H	S-C-L	S-C-L	F-R-L	F-R-L	S-L-H
F-C-L	S-L-L	F-C-L	S-C-H	S-L-L	S-C-L	F-C-L	F-L-L
S-C-L	F-L-L	S-C-L	S-C-L	F-R-H	F-L-H	F-C-L	S-R-H
F-L-H	F-L-L	S-C-H	S-C-H	F-C-H	F-R-H	S-C-H	F-C-H
S-C-L	F-C-H	F-C-L	S-R-H	S-L-H	S-C-L	S-L-H	F-L-L
S-R-L	F-R-H	S-R-L	F-C-L	S-C-H	F-R-L	S-R-L	S-C-L
F-L-H	F-R-H	F-R-H	F-L-L	F-R-L	F-L-L	F-R-H	F-C-H
S-C-H	S-R-H	F-R-L	S-R-L	F-R-H	S-R-L	S-R-H	S-R-L
S-C-H	S-R-H	F-C-H	S-R-H	F-L-L	F-R-H	F-C-H	F-C-H
F-R-L	S-C-L	S-C-H	F-L-L	F-L-H	S-C-L	F-R-H	S-R-H
S-L-L	F-C-L	F-C-H	F-C-L	S-R-L	F-R-H	S-C-L	F-L-L
F-L-L	F-L-L	S-L-L	F-C-L	S-R-H	F-L-H	S-L-H	S-C-L
F-R-H	F-L-L	S-R-H	F-L-H	F-C-L	S-R-L	F-L-L	F-L-H
F-R-H	S-C-L	F-L-H	S-R-L	F-C-H	F-L-H	F-R-H	S-R-L
F-C-H	F-C-H	S-R-H	F-L-H	F-R-H	S-R-H	S-R-L	S-C-L
S-C-H	S-R-L	S-L-H	S-R-L	S-L-L	F-L-L	F-R-H	S-C-L
S-C-L	S-R-L	F-R-L	F-L-H	S-L-H	S-L-L	F-R-H	F-L-H
F-R-L	F-L-H	S-L-L	S-C-H	F-C-H	S-R-H	S-C-H	F-C-H
F-C-L	F-L-H	S-R-L	F-R-H	F-R-H	F-L-L	S-R-L	S-L-L

Subject 3322		Subject 3422		Subject 3522		Subject 3622	
S-L-L	F-R-L	S-R-L	F-L-H	F-L-L	F-R-L	F-C-L	F-R-H
F-L-H	F-C-L	F-C-H	F-R-H	S-C-L	S-R-H	S-R-L	S-C-L
F-R-H	S-C-H	F-C-L	F-C-H	F-R-H	F-L-L	S-R-L	S-R-H
F-R-L	S-L-H	S-R-H	S-L-L	F-L-L	S-R-L	S-L-H	S-L-L
F-R-H	F-L-L	S-R-L	S-R-H	F-L-H	S-L-L	F-C-H	F-L-L
S-C-L	S-C-L	S-C-H	S-C-H	F-R-H	F-C-L	S-L-L	S-R-L
S-L-L	F-R-H	S-C-H	S-R-H	F-R-L	F-L-H	F-R-L	S-R-H

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 3322		Subject 3422		Subject 3522		Subject 3622	
F-R-L	F-L-L	F-L-L	S-C-H	S-L-L	S-C-H	S-C-L	S-C-L
S-C-L	F-C-H	F-L-H	S-C-H	S-C-H	S-L-H	F-L-L	S-C-L
F-R-H	S-L-H	F-L-H	S-R-L	F-R-L	F-C-H	S-C-H	S-C-H
S-L-H	F-L-L	F-R-L	F-R-H	S-R-L	F-C-H	F-R-H	S-C-L
F-C-L	F-L-H	S-L-L	F-C-H	S-C-H	S-C-L	F-L-L	S-L-H
F-L-L	S-C-L	F-R-L	S-C-L	F-C-L	F-L-L	F-C-L	F-C-L
F-L-H	S-C-L	S-L-H	S-L-H	F-C-L	S-L-H	S-C-L	F-L-L
S-R-H	F-L-L	F-R-H	S-C-H	F-R-L	S-L-H	S-L-H	F-R-H
S-C-H	S-R-H	S-L-L	F-L-L	F-C-H	S-R-H	S-L-L	F-C-H
S-C-H	F-L-H	S-C-L	S-C-H	S-R-H	S-R-L	F-C-H	F-R-H
S-R-L	F-R-L	S-L-L	S-C-L	S-L-L	F-R-H	S-R-L	S-C-H
F-C-H	S-L-L	S-C-L	F-R-L	S-R-H	S-L-L	S-R-H	F-R-H
S-L-L	F-R-L	F-R-H	S-L-L	S-L-H	F-R-L	F-L-H	F-R-L
F-C-H	S-L-H	F-R-L	S-R-H	F-L-H	F-C-L	S-R-L	S-R-H
S-R-L	F-R-L	S-L-L	F-L-H	S-C-L	S-C-H	F-L-L	S-C-H
F-L-L	F-C-H	S-C-L	S-R-L	S-C-H	S-R-L	S-C-L	F-L-H
S-L-H	S-L-H	S-C-L	F-L-L	S-L-H	S-C-H	F-R-H	F-C-H
F-C-H	S-R-H	F-L-H	F-L-H	S-L-L	F-C-L	F-R-L	S-L-L
S-L-H	S-R-H	F-C-L	S-R-H	S-C-L	F-C-L	S-L-L	S-L-L
S-R-L	F-C-H	S-L-H	F-R-L	F-L-H	F-R-L	F-C-H	S-L-H
S-C-H	F-L-H	F-C-L	S-C-L	F-R-L	F-C-H	F-L-L	F-C-H
F-C-L	S-C-H	F-C-H	S-R-L	F-C-H	S-L-L	F-L-H	F-R-L
F-C-H	F-R-H	S-L-H	F-L-H	F-C-H	S-C-L	S-L-H	F-R-L
F-C-L	S-R-L	S-C-H	S-L-L	F-C-L	S-C-L	S-C-H	S-R-H
S-L-L	F-C-H	F-R-H	F-R-L	F-R-H	S-L-L	S-R-H	F-L-H
S-C-L	F-L-L	F-C-L	F-R-H	S-C-H	S-C-H	F-C-L	S-L-H
S-R-L	S-L-L	F-L-L	F-C-L	S-R-L	F-C-H	F-R-L	F-C-H
S-R-H	F-C-L	S-R-H	S-L-L	F-L-L	F-R-H	F-R-H	S-L-L
F-R-L	S-C-H	F-L-L	F-C-H	S-R-H	F-R-H	S-L-L	F-L-H
F-L-L	F-R-H	S-R-H	F-C-L	S-R-H	F-L-H	F-L-H	S-R-L
F-R-H	F-C-L	F-L-L	S-L-H	F-C-L	S-C-L	F-C-L	F-L-L
S-R-H	F-R-H	S-R-L	F-C-L	S-L-H	F-R-H	S-C-L	S-R-L
F-L-H	F-C-L	F-R-L	F-L-H	F-L-L	F-L-H	F-R-L	F-C-L
S-C-L	S-R-H	S-R-L	F-L-L	S-L-H	S-R-L	S-R-L	S-R-H
F-L-H	S-R-L	F-C-H	S-R-H	S-R-L	S-R-H	S-C-H	F-C-L
S-L-H	S-R-L	S-L-H	S-L-H	F-R-H	F-L-L	S-L-H	F-C-H
S-C-H	F-L-H	F-R-L	F-C-L	S-L-H	F-L-L	S-C-H	F-L-L
S-L-L	S-R-L	F-C-H	F-L-L	S-L-L	S-R-L	F-C-L	S-R-L
F-R-L	S-C-H	S-C-L	F-R-H	F-C-H	F-L-H	S-L-H	F-L-H
S-C-L	S-R-H	S-L-H	F-R-H	S-R-H	S-C-L	S-C-H	F-L-H
S-L-L	F-C-L	S-R-L	F-C-H	F-R-L	F-L-H	F-R-L	F-R-H

Subject 3731		Subject 3831		Subject 3931		Subject 4031	
S-L-L	F-R-L	S-L-L	F-R-L	S-L-L	S-R-H	S-L-L	F-R-L
F-L-L	S-L-H	S-R-L	S-R-L	F-R-L	F-R-H	S-L-H	F-L-L

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 3731		Subject 3831		Subject 3931		Subject 4031	
F-R-L	F-L-L	F-C-L	F-C-H	F-L-L	S-L-L	F-L-L	S-R-L
F-C-L	S-R-L	F-L-L	S-L-H	F-C-H	S-C-L	F-C-L	S-L-H
S-R-L	S-R-H	S-C-H	F-L-L	F-L-L	S-C-L	F-R-H	F-C-L
S-C-H	F-L-L	F-C-H	S-L-H	S-R-L	F-R-L	F-R-L	S-R-H
F-C-H	S-C-L	F-R-L	F-C-L	F-C-H	F-C-L	S-C-L	S-L-L
S-R-H	F-C-L	F-L-L	S-R-L	S-R-L	F-C-H	F-C-L	S-L-H
S-C-H	F-R-L	S-L-L	S-L-H	F-L-L	S-L-L	S-R-H	F-L-L
F-L-H	S-R-H	F-C-H	S-R-H	F-R-H	F-L-H	F-C-L	F-L-L
F-R-H	F-L-H	S-R-L	S-C-L	S-R-L	S-L-H	F-C-H	S-R-H
F-R-L	F-R-H	S-R-L	F-L-L	S-L-H	S-R-L	S-L-L	S-R-L
F-L-L	S-L-H	F-R-L	F-L-L	F-C-L	F-L-H	F-C-H	F-L-H
S-R-H	F-C-L	S-L-H	S-R-L	S-L-H	F-C-H	F-R-H	F-C-L
S-R-L	S-C-H	S-C-L	F-C-L	S-L-L	F-R-L	S-R-L	F-R-H
F-R-H	S-L-H	F-R-H	S-C-H	S-C-L	S-C-L	F-L-L	F-C-H
S-L-H	S-C-H	S-R-H	S-R-H	S-C-H	S-R-H	F-L-H	S-C-L
S-L-H	S-C-L	F-L-H	F-R-H	F-C-L	F-R-H	S-R-H	S-C-H
F-C-L	F-L-L	S-C-L	F-C-L	S-C-L	S-C-H	F-L-H	F-C-H
S-L-H	S-R-H	F-C-L	F-R-L	F-C-L	F-R-L	F-L-L	S-L-L
F-L-L	F-C-H	S-L-H	F-L-H	S-R-H	S-R-L	S-L-H	F-C-L
S-C-L	S-R-L	F-L-L	F-C-H	F-R-H	S-C-H	S-C-H	F-R-L
F-C-H	F-C-L	S-R-H	S-L-L	S-R-H	S-L-L	S-C-H	F-R-L
S-L-H	S-L-L	S-R-H	S-L-L	F-L-H	F-L-H	S-R-L	S-C-H
S-R-L	F-C-H	S-C-H	S-L-L	F-L-H	F-L-L	F-R-H	F-R-H
S-C-H	F-R-H	F-L-H	F-R-H	F-R-L	F-L-L	F-L-L	S-C-H
S-C-L	F-L-H	S-R-H	F-R-H	F-R-L	F-R-H	S-R-L	F-L-H
S-L-H	S-L-L	S-L-H	S-L-L	F-C-H	F-C-L	S-L-L	S-C-H
F-C-L	F-L-H	F-R-H	F-R-H	S-C-H	S-L-H	S-C-L	F-C-H
S-R-L	F-R-L	S-R-L	S-C-H	S-C-L	F-L-L	F-R-L	F-R-L
F-R-H	F-C-H	S-C-H	F-L-L	S-C-H	S-R-L	F-L-H	S-L-H
F-L-L	S-L-L	F-L-L	S-C-L	S-R-L	S-C-H	S-C-L	F-R-H
F-R-L	S-L-L	S-C-L	F-C-H	S-R-H	F-C-H	F-R-L	S-C-L
F-R-H	S-C-L	F-C-H	F-R-L	F-L-H	S-R-H	F-C-L	F-C-H
F-L-H	F-C-L	F-L-H	S-C-H	F-R-L	S-L-H	S-C-H	F-R-H
F-C-H	F-R-H	S-L-H	F-L-H	S-L-L	S-C-L	F-C-H	F-R-L
S-C-L	F-L-L	F-L-H	F-R-L	S-L-H	F-R-H	S-R-H	F-C-L
S-R-H	S-L-H	S-C-H	F-C-H	F-C-L	F-C-L	F-R-H	S-R-L
S-C-L	S-C-H	F-R-L	F-C-L	S-L-L	S-R-L	F-L-H	S-R-H
F-L-H	S-C-L	S-L-L	F-L-H	S-C-H	S-L-H	S-L-H	S-R-L
F-C-L	F-R-H	F-C-H	F-L-H	S-C-L	F-R-L	F-R-L	S-L-L
F-R-L	F-R-L	S-L-L	S-R-H	F-C-H	F-C-L	S-L-H	F-L-L
S-C-H	S-R-L	F-R-H	S-C-L	F-R-H	S-C-H	S-C-L	S-R-H
S-L-L	S-R-H	F-C-L	S-C-H	F-L-H	F-L-H	F-C-H	S-C-L
F-C-H	S-C-H	F-R-L	S-L-H	S-L-H	S-L-L	S-R-L	S-L-L
S-L-L	F-L-H	S-C-L	S-R-L	F-R-H	F-C-H	S-L-L	S-L-H
F-L-H	F-C-H	F-C-L	S-C-L	S-R-H	S-R-H	S-C-H	F-C-H
S-R-H	S-R-L	F-R-H	S-R-H	F-L-L	F-L-L	S-R-H	S-C-L

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 4131		Subject 4231		Subject 4331		Subject 4431	
S-R-L	S-R-L	S-R-L	F-R-H	F-C-H	F-R-L	F-L-L	S-R-L
F-C-L	S-L-L	F-R-L	F-C-H	F-R-L	F-C-L	S-R-H	F-C-H
S-R-L	F-R-H	F-R-H	F-C-L	S-L-L	S-L-H	F-C-H	F-C-L
S-L-H	S-C-H	F-R-L	S-C-L	F-L-H	S-C-L	F-L-L	F-L-L
S-L-L	S-L-L	S-C-L	S-R-L	F-R-H	F-R-L	S-L-H	S-R-H
F-C-H	F-L-H	F-R-L	S-L-H	F-L-L	F-L-L	S-C-L	S-R-L
F-R-L	F-R-H	S-C-H	F-R-L	S-C-L	F-C-H	S-R-H	S-C-H
F-L-L	F-L-H	F-R-H	F-L-L	S-L-H	S-R-L	F-C-L	S-C-H
F-R-H	S-R-H	F-C-L	S-L-L	F-C-L	S-L-H	S-R-L	F-L-L
S-C-H	F-R-L	S-L-L	S-L-H	F-L-L	F-C-L	F-R-H	S-L-L
F-R-H	S-C-L	S-R-H	F-L-L	F-R-L	F-R-H	F-C-H	F-L-H
S-C-L	F-R-H	F-L-H	S-C-H	F-L-H	S-R-H	F-R-L	F-L-H
F-L-L	F-L-H	F-L-H	S-C-L	F-R-H	F-L-L	S-L-L	F-R-L
F-C-L	S-C-L	S-C-L	S-R-H	S-R-H	F-L-H	S-C-H	F-R-L
F-C-H	S-L-H	F-C-L	S-L-H	S-L-L	F-L-H	S-L-H	S-C-L
S-C-L	S-C-H	S-L-H	F-R-H	S-C-H	S-C-H	F-C-L	S-L-H
S-C-H	S-R-L	F-L-L	S-L-L	S-R-L	S-R-H	F-L-H	F-R-H
S-L-H	F-R-L	S-C-H	F-C-H	S-R-L	F-C-H	F-L-H	S-L-L
S-L-L	S-R-H	S-L-L	F-C-L	S-C-H	S-R-L	S-R-H	S-C-H
F-C-H	S-L-L	F-C-H	S-R-L	S-R-H	S-L-L	S-C-L	S-C-L
S-R-H	F-L-L	S-L-H	F-L-L	F-L-H	S-R-H	F-L-L	S-L-L
S-R-L	F-C-H	S-R-H	F-R-L	S-L-H	F-R-H	F-C-H	S-C-L
S-R-H	F-C-H	S-R-L	S-C-L	F-C-H	F-C-H	F-R-L	F-R-H
F-L-H	F-R-L	F-R-H	F-L-H	S-C-L	F-L-L	S-C-H	F-R-L
S-R-L	F-C-L	S-R-L	S-R-H	S-L-L	F-L-H	S-R-L	F-R-L
F-L-H	S-C-H	S-R-L	S-L-L	S-C-H	F-R-L	S-R-L	S-L-L
S-C-L	F-C-H	F-L-H	F-L-H	S-L-L	S-L-L	S-C-H	S-C-L
S-L-H	S-R-H	S-C-H	S-C-L	S-C-L	F-R-H	F-R-L	S-R-H
F-R-H	F-C-H	F-C-H	S-L-H	F-R-L	F-C-L	F-R-H	F-L-L
F-L-L	F-L-L	F-L-L	S-R-H	F-C-H	S-L-H	S-R-L	S-L-H
S-L-L	S-L-H	S-R-H	F-R-L	F-C-L	F-L-L	F-C-L	S-L-H
F-C-H	S-L-L	F-C-L	F-C-L	F-C-L	F-C-L	S-C-L	F-C-L
F-R-L	F-L-L	S-L-L	F-R-H	F-C-H	S-C-L	F-L-H	F-C-L
F-L-L	F-R-H	F-L-L	F-L-L	F-L-H	S-C-H	S-L-L	F-C-H
F-L-H	S-R-H	F-L-L	F-L-H	F-R-H	S-R-H	S-C-H	S-L-H
S-L-H	F-C-L	F-R-H	F-C-H	F-R-H	S-L-H	S-L-H	S-C-H
S-C-H	S-L-H	S-L-H	F-L-L	S-C-H	S-C-L	S-L-H	F-R-H
F-C-L	S-L-H	F-C-L	S-C-L	S-C-L	S-L-L	S-R-H	F-R-H
S-R-H	S-C-L	S-R-H	S-C-H	S-R-H	F-L-H	F-C-L	F-C-L
F-R-L	S-C-L	S-C-H	S-C-H	F-R-L	F-R-H	F-L-H	F-L-H
F-R-H	F-C-L	F-L-H	S-R-L	F-L-L	S-R-L	F-R-H	S-R-H
S-L-L	F-L-L	F-C-H	F-R-H	S-R-H	F-R-L	S-L-L	F-L-L
F-L-H	S-R-L	F-R-L	F-R-L	S-L-H	S-C-H	F-R-L	S-R-H
F-C-L	S-R-L	S-L-H	F-C-H	S-R-L	F-C-H	S-C-L	F-L-L
S-C-L	F-C-L	F-C-H	S-C-H	S-L-H	S-C-L	F-C-H	S-R-L
F-R-L	S-C-H	S-L-L	S-L-L	S-R-L	S-L-L	F-L-L	F-C-H
S-R-L	F-L-H	S-C-L	S-R-H	F-C-L	S-R-L	S-L-L	S-R-L
S-C-H	F-R-L	S-C-L	F-L-H	F-L-L	S-C-H	F-R-H	F-C-H

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 4531		Subject 4632		Subject 4732		Subject 4832	
S-L-L	S-L-H	S-R-H	S-R-L	S-R-L	S-C-L	F-C-H	S-C-L
S-C-L	F-R-H	S-R-L	S-C-L	S-C-L	F-R-H	S-L-L	S-R-L
F-R-H	S-R-L	F-C-L	F-L-L	F-R-L	F-L-H	S-L-L	S-L-L
S-L-H	S-R-L	F-R-L	F-R-L	F-C-L	F-R-H	F-C-H	F-C-L
F-L-L	S-C-H	F-C-H	F-R-L	S-L-L	S-C-L	S-L-L	F-R-H
F-L-H	S-C-L	F-R-L	F-R-H	S-C-H	F-L-H	F-R-L	F-L-L
F-R-L	F-C-H	F-L-L	F-L-H	S-C-H	S-L-H	F-C-H	S-C-H
F-R-H	S-L-L	F-R-H	S-C-H	F-R-L	S-R-L	F-L-H	F-R-H
S-L-L	F-C-H	F-L-L	S-L-L	F-C-H	S-R-H	S-R-H	F-R-L
S-C-H	F-C-L	S-L-H	F-L-H	F-L-H	S-C-H	S-C-L	S-L-H
F-R-L	S-L-H	F-R-L	S-C-L	F-C-H	F-R-L	F-R-H	S-R-L
F-L-L	S-C-H	S-C-L	S-R-H	F-R-H	F-R-H	S-R-L	F-C-H
S-R-L	F-C-L	F-L-L	F-R-H	S-R-L	F-L-L	F-C-L	S-L-H
S-C-H	F-L-L	F-L-H	F-C-L	S-L-L	S-L-H	F-R-L	S-C-H
F-R-H	S-R-L	S-R-L	F-L-L	S-R-H	S-C-H	F-R-L	F-L-H
F-C-L	F-L-L	S-R-H	S-C-H	S-R-H	F-R-L	S-L-H	F-R-L
F-R-L	F-R-L	S-L-H	S-L-H	F-R-L	S-R-L	F-L-H	F-C-L
F-C-H	F-R-H	S-R-H	S-L-L	F-L-H	F-C-L	S-C-H	S-R-H
S-C-L	S-R-H	F-C-H	S-C-H	S-L-L	F-C-L	F-L-L	S-C-L
S-L-L	F-C-L	S-L-L	F-C-H	F-L-L	S-L-L	F-R-H	F-L-H
S-R-H	S-L-L	F-C-H	S-L-H	F-L-H	S-L-L	S-C-L	S-L-L
S-C-H	F-L-H	S-C-H	F-C-H	S-C-H	F-C-H	S-C-H	F-R-L
F-L-H	F-C-H	S-L-H	S-R-H	S-L-H	F-L-H	S-R-L	S-C-H
S-C-L	S-R-H	S-R-L	S-L-L	S-C-L	S-L-H	S-C-H	F-R-H
S-C-H	F-L-L	F-R-H	F-C-H	F-R-H	F-C-L	F-L-L	S-L-H
S-L-L	F-C-L	F-L-H	F-L-L	F-C-L	S-R-H	S-L-H	S-R-L
S-C-L	S-L-H	F-L-H	F-R-L	F-C-H	F-L-L	F-C-L	S-C-L
S-R-L	F-C-H	S-C-H	S-L-H	F-R-H	F-C-H	F-R-H	S-R-H
F-L-H	S-L-H	S-R-H	F-C-H	S-L-L	F-L-L	S-R-H	S-C-L
F-L-H	S-L-L	S-C-L	S-R-H	F-R-L	S-L-L	F-R-H	S-C-H
F-R-L	S-C-L	S-C-H	S-R-L	F-C-L	S-R-L	F-R-L	F-L-H
F-C-H	S-R-H	F-L-L	F-R-H	S-R-L	S-C-H	S-L-H	F-C-H
F-C-L	F-R-L	S-L-H	S-R-H	F-L-L	S-L-H	S-C-L	F-L-L
F-C-H	S-C-L	F-R-L	S-L-H	S-L-H	S-C-L	F-L-H	F-L-L
F-C-L	F-L-H	F-C-L	S-C-L	S-R-H	F-L-L	S-C-L	S-L-L
F-R-H	F-L-H	S-C-L	F-C-L	S-L-H	F-C-L	F-L-L	S-L-H
S-R-H	S-C-L	S-L-L	F-L-H	F-C-L	F-R-L	F-C-L	F-C-H
S-R-L	S-R-L	F-C-L	S-C-L	F-C-H	F-C-H	S-R-H	S-R-L
F-C-H	F-L-H	F-R-H	S-L-L	F-R-H	F-R-H	S-L-H	F-C-L
F-L-L	S-R-H	F-L-H	F-L-H	S-C-H	F-C-H	S-R-L	F-R-L
S-R-H	S-C-H	F-R-H	F-L-L	S-C-L	S-R-L	S-C-H	F-C-L
S-R-H	S-C-H	S-R-L	F-C-L	F-L-L	S-C-L	F-C-H	F-R-H
S-C-H	F-R-L	S-C-L	S-R-L	F-L-H	S-R-H	F-L-L	F-L-H
F-C-L	F-R-L	F-R-L	F-C-L	F-L-L	S-R-H	S-L-L	S-L-L
S-L-H	S-L-L	F-C-H	S-C-H	S-C-L	S-C-H	F-C-H	S-R-H
F-L-L	F-L-L	S-C-H	S-R-H	S-L-H	F-L-H	S-R-L	F-L-L
S-L-H	F-R-H	S-L-L	F-R-H	S-R-L	S-L-L	F-C-L	S-R-H
S-R-L	F-R-H	S-L-L	F-R-L	S-R-H	F-R-L	S-R-H	F-C-H

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 4932		Subject 5032		Subject 5132		Subject 5232	
S-R-L	F-R-L	S-R-L	F-C-L	S-L-H	S-L-H	F-R-H	F-R-H
S-R-L	F-R-L	S-L-L	F-C-L	S-C-H	F-C-L	S-L-L	F-L-L
S-R-H	F-L-L	S-C-H	S-C-H	S-C-L	F-R-L	F-L-H	S-R-L
F-R-H	F-R-H	F-L-H	F-R-L	F-R-L	F-C-L	S-L-L	F-R-L
S-C-H	F-L-L	F-C-H	S-R-L	F-L-H	S-R-L	F-L-L	S-C-H
F-C-L	F-C-H	F-R-H	S-R-H	S-L-L	F-L-H	S-R-H	F-C-H
F-L-L	S-C-L	S-L-L	S-L-L	F-L-H	F-C-H	S-C-L	F-R-H
F-L-H	F-L-H	F-L-L	F-L-L	S-L-H	S-L-H	F-R-L	S-L-L
F-C-H	F-C-L	S-C-H	S-L-L	S-R-L	F-C-H	F-R-L	F-L-L
S-L-L	F-R-L	F-L-H	S-R-L	S-C-L	S-R-H	F-R-H	S-R-L
S-R-H	F-C-L	S-C-L	S-C-H	F-R-L	S-L-L	F-L-H	S-R-H
S-C-H	S-C-H	S-L-H	F-R-L	F-R-H	F-L-L	F-C-L	F-L-H
S-C-L	S-L-H	S-R-L	S-C-L	S-R-L	F-L-L	S-C-H	S-L-H
F-R-L	F-L-L	F-L-L	S-L-H	F-C-L	S-R-H	F-L-H	F-L-H
F-R-L	F-L-H	S-C-H	S-C-L	S-R-H	F-L-L	S-C-L	F-L-L
F-L-H	S-R-H	F-R-L	F-L-H	S-C-H	S-C-L	F-R-L	S-C-L
F-R-H	S-R-L	S-C-H	F-R-H	F-L-H	F-R-L	S-R-L	S-L-H
S-C-H	F-R-H	F-R-H	S-R-L	S-C-H	S-L-H	S-L-H	F-C-L
S-R-L	S-L-L	F-L-L	F-R-L	F-L-L	F-R-H	F-C-H	S-R-H
S-C-H	F-C-L	F-L-H	F-C-H	F-R-L	S-C-L	S-L-L	S-C-H
F-R-L	F-C-H	S-C-L	F-L-L	F-C-H	S-R-L	S-C-H	F-C-H
F-R-H	S-C-H	F-C-L	F-L-C	F-C-H	F-L-H	F-R-H	F-R-L
S-L-L	F-C-L	F-C-H	S-C-L	F-R-H	S-C-H	S-L-H	S-L-H
S-C-L	S-C-L	F-C-L	F-R-H	S-L-L	S-C-H	S-C-L	F-C-L
S-L-H	F-R-L	F-L-L	S-L-L	S-R-L	S-C-H	S-C-H	S-L-L
F-L-H	F-L-H	F-R-L	S-L-H	F-L-L	S-L-L	S-R-L	F-L-H
S-C-L	S-L-L	S-C-L	F-L-H	F-R-H	F-C-H	S-L-H	S-R-H
F-R-H	S-R-L	S-L-H	F-R-H	F-C-H	F-R-L	F-C-L	S-C-H
S-C-H	S-L-H	F-R-H	S-C-L	S-L-L	S-C-L	S-C-L	S-R-L
F-L-L	F-R-H	S-L-H	S-R-H	F-C-L	S-C-H	F-L-L	S-C-L
S-R-H	S-L-H	S-R-H	S-L-H	F-C-L	S-R-L	S-C-H	S-C-L
F-C-H	F-L-L	S-L-L	S-R-H	S-C-H	S-R-L	F-R-H	F-R-H
F-C-L	S-R-H	S-R-H	S-L-H	S-L-H	S-C-L	F-C-H	F-R-L
F-L-H	F-L-H	S-R-L	S-L-L	F-C-H	S-L-L	S-L-H	F-L-L
F-L-L	F-C-H	S-R-L	F-R-L	F-R-L	F-R-H	S-R-H	S-L-L
F-C-H	F-C-H	S-C-H	F-L-H	S-C-L	F-C-H	S-L-L	S-C-H
S-R-H	F-L-L	F-L-L	F-C-H	F-C-L	F-R-H	F-C-L	S-R-L
S-L-L	F-R-L	F-R-H	F-C-L	S-C-L	F-R-L	F-C-H	S-L-H
S-C-L	S-R-H	F-R-L	F-L-H	F-R-H	F-C-L	F-L-L	S-R-H
F-C-H	S-L-L	F-L-H	F-C-L	F-L-L	F-L-L	F-R-L	F-R-H
S-L-L	S-R-H	F-C-H	S-L-L	S-R-H	S-R-H	F-C-L	F-C-L
S-R-L	S-C-L	S-C-H	S-R-H	S-R-L	S-L-H	S-R-L	F-C-H
S-R-L	S-R-L	F-L-L	F-C-H	S-R-H	F-C-H	S-R-L	F-L-H
F-R-H	F-C-L	F-R-H	S-R-H	F-L-H	F-L-H	S-R-H	F-C-H
S-L-L	S-C-L	S-R-L	S-C-L	S-R-H	F-L-H	F-L-H	F-R-L
S-L-H	F-C-L	F-R-L	F-C-L	S-L-H	S-R-H	S-R-H	S-L-L
S-C-H	S-L-H	F-C-H	S-R-H	S-L-L	F-C-L	F-L-L	S-C-L
S-L-H	S-L-L	S-L-H	F-C-H	F-L-L	S-L-L	F-C-H	F-C-L

ORDER OF PRESENTATION OF EXPERIMENTAL CONDITIONS (CONT'D)

Subject 5332		Subject 5432	
F-C-L	S-R-L	F-C-H	F-C-L
F-C-H	F-L-H	S-R-L	S-R-L
S-R-L	S-L-H	S-C-H	S-L-H
S-L-H	F-C-H	F-C-L	S-R-H
F-R-L	S-L-L	S-C-L	S-L-H
F-R-L	S-R-L	F-L-L	S-C-H
F-L-L	F-C-L	F-L-L	F-L-H
F-R-H	F-L-L	F-R-H	S-R-L
F-L-L	F-R-H	S-L-L	F-L-L
F-R-H	F-C-H	F-C-H	F-C-H
F-C-L	S-C-L	F-R-L	F-L-L
S-L-L	S-R-H	S-L-H	S-L-L
S-C-H	F-R-L	S-C-L	F-R-H
S-R-H	F-R-H	F-C-H	F-L-L
S-R-H	S-C-H	F-R-H	S-R-L
F-L-H	F-L-L	S-R-L	S-R-H
S-R-H	F-C-L	F-C-L	F-C-L
S-C-L	F-L-H	S-C-H	S-C-L
F-L-L	S-C-H	F-L-H	F-C-H
S-L-H	S-L-H	S-R-H	F-R-L
S-L-H	F-L-L	F-L-H	S-C-L
F-C-H	S-R-H	F-L-L	F-R-H
S-R-L	S-R-L	S-R-H	S-L-H
F-R-H	S-C-H	S-C-H	F-C-L
F-R-L	F-R-H	S-C-L	S-C-H
S-C-H	S-C-L	S-R-L	S-C-L
S-C-L	S-L-L	F-C-L	F-R-L
F-C-L	F-C-H	S-L-L	S-R-L
S-L-H	S-C-L	S-L-H	S-R-H
F-C-L	S-R-L	S-C-L	S-L-L
S-C-L	F-L-H	S-R-H	F-R-H
F-R-L	F-R-L	F-R-L	F-C-H
F-L-H	S-L-H	S-C-H	S-C-H
F-C-H	S-C-H	F-L-H	S-L-L
S-C-L	S-L-H	S-L-L	F-C-L
S-C-H	F-C-L	F-R-H	F-R-L
S-L-L	S-R-H	F-R-L	S-C-H
S-L-L	S-C-L	S-R-H	S-L-H
F-L-H	F-L-L	F-C-L	F-R-L
F-L-L	F-R-H	F-L-L	F-L-H
S-R-L	S-R-H	F-R-H	F-L-H
F-R-H	F-C-L	S-R-L	F-L-L
S-R-H	F-R-L	F-R-L	F-R-H
F-L-H	F-C-H	F-C-H	S-C-L
S-C-H	F-L-H	S-L-L	S-R-H
F-C-H	S-L-L	S-L-H	F-L-H
S-L-L	F-R-L	S-L-H	F-C-H
S-R-L	S-L-L	F-L-H	S-L-L

RAW SCORES--REACTION TIME

SUBJECT IDENTI- FICATION	CONDI- TION	TRIALS 1	2	3	4	5	6	7	8
01JH	SRL	.90	.99	.81	.63	.63	.64	.72	.76
01JH	SRH	.90	.96	.62	.45	.41	.45	.44	.45
01JH	SCL	.73	.71	.71	.32	.47	.37	.47	.47
01JH	SCH	.75	.51	.95	.43	.39	.74	.35	.59
01JH	SLL	.54	.40	.40	.64	.47	.59	.40	.49
01JH	SLH	.44	.63	.45	.55	.45	.59	.51	.51
01JH	FRL	.86	.34	.31	.37	.31	.39	.37	.36
01JH	FRH	.52	.39	.37	.28	.21	.31	.22	.32
01JH	FCL	.50	.49	.43	.39	.32	.61	.49	.46
01JH	FCH	.52	.52	.43	.52	.42	.22	.33	.42
01JH	FLL	.45	.52	.43	.48	.25	.30	.32	.39
01JH	FLH	.46	.33	.40	.40	.42	.40	.43	.40
02JH	SRL	.37	.30	.29	.26	.22	.29	.22	.28
02JH	SRH	.30	.33	.28	.22	.25	.21	.20	.25
02JH	SCL	.49	.47	.45	.40	.31	.37	.20	.38
02JH	SCH	.50	.29	.51	.33	.56	.41	.53	.45
02JH	SLL	.72	.72	.65	.42	.45	.33	.72	.57
02JH	SLH	.40	.59	.31	.30	.37	.49	.35	.40
02JH	FRL	.39	.29	.37	.30	.34	.32	.35	.34
02JH	FRH	.34	.37	.29	.29	.26	.31	.22	.29
02JH	FCL	.35	.38	.40	.33	.40	.40	.35	.37
02JH	FCH	.46	.52	.32	.28	.25	.25	.24	.33
02JH	FLL	.36	.33	.27	.24	.35	.22	.33	.30
02JH	FLH	.41	.35	.26	.31	.37	.24	.31	.32
03JH	SRL	.20	.27	.35	.28	.24	.33	.28	.26
03JH	SRH	.22	.24	.33	.24	.22	.22	.22	.26
03JH	SCL	.32	.40	.31	.30	.22	.23	.29	.30
03JH	SCH	.39	.28	.52	.35	.25	.54	.23	.25
03JH	SLL	.36	.27	.27	.27	.26	.30	.26	.20
03JH	SLH	.34	.27	.29	.30	.22	.30	.40	.31
03JH	FRL	.23	.32	.30	.31	.37	.38	.20	.37
03JH	FRH	.25	.31	.44	.35	.34	.36	.37	.35
03JH	FCL	.39	.28	.30	.31	.29	.28	.29	.31
03JH	FCH	.43	.21	.30	.32	.36	.35	.37	.22
03JH	FLL	.34	.29	.38	.38	.45	.22	.46	.45
03JH	FLH	.43	.22	.31	.29	.35	.29	.24	.22
04JH	SRL	.39	.33	.33	.36	.38	.37	.33	.38
04JH	SRH	.39	.31	.36	.34	.36	.34	.21	.40
04JH	SCL	.38	.33	.35	.32	.23	.22	.36	.34
04JH	SCH	.44	.42	.36	.34	.37	.38	.39	.24
04JH	SLL	.32	.30	.23	.28	.25	.27	.29	.27
04JH	SLH	.37	.27	.29	.27	.27	.27	.22	.21
04JH	FRL	.32	.32	.41	.36	.33	.35	.37	.39
04JH	FRH	.36	.32	.26	.27	.24	.25	.21	.22
04JH	FCL	.50	.43	.36	.32	.21	.24	.24	.24

RAW SCORES--REACTION TIME

SUBJECT IDENTI- FICATION	CONDI- TION	TRIALS 1	2	3	4	5	6	7	8
04JH	FCH	.47	.38	.41	.31	.22	.25	.21	.20
04JH	FLL	.36	.31	.24	.27	.21	.25	.23	.29
04JH	FLH	.39	.25	.28	.28	.23	.27	.26	.28
05JH	SRL	.30	.37	.50	.35	.38	.37	.34	.39
05JH	SRH	.28	.21	.19	.27	.20	.20	.23	.23
05JH	SCL	.49	.53	.52	.49	.40	.48	.43	.48
05JH	SCH	.44	.26	.28	.32	.27	.26	.26	.31
05JH	SLL	.30	.27	.26	.27	.25	.26	.21	.26
05JH	SLH	.36	.28	.31	.34	.36	.33	.38	.34
05JH	FRL	.31	.34	.29	.53	.35	.31	.39	.36
05JH	FRH	.28	.30	.33	.27	.25	.24	.29	.27
05JH	FCL	.41	.39	.36	.33	.34	.33	.36	.36
05JH	FCH	.33	.38	.27	.35	.30	.31	.31	.31
05JH	FLL	.32	.30	.23	.34	.31	.30	.35	.31
05JH	FLH	.29	.26	.23	.26	.21	.21	.21	.23
06JH	SRL	.22	.63	.54	.44	.60	.57	.50	.50
06JH	SRH	.32	.28	.27	.30	.36	.45	.21	.31
06JH	SCL	.36	.32	.48	.47	.31	.44	.40	.36
06JH	SCH	.40	.40	.43	.47	.30	.37	.43	.40
06JH	SLL	.27	.27	.47	.20	.21	.21	.27	.27
06JH	SLH	.32	.37	.33	.32	.22	.26	.29	.30
06JH	FRL	.22	.29	.25	.20	.21	.22	.35	.25
06JH	FRH	.28	.29	.29	.21	.38	.25	.33	.29
06JH	FCL	.46	.45	.41	.38	.32	.37	.38	.40
06JH	FCH	.44	.26	.27	.26	.30	.29	.25	.29
06JH	FLL	.29	.21	.32	.29	.25	.26	.26	.27
06JH	FLH	.22	.29	.31	.32	.22	.28	.22	.26
07JH	SRL	.83	.80	.78	.63	.72	.88	.77	.73
07JH	SRH	.48	.75	.71	.79	.71	.75	.78	.74
07JH	SCL	.50	.72	.61	.61	.66	.59	.62	.58
07JH	SCH	.57	.54	.57	.64	.64	.52	.57	.51
07JH	SLL	.42	.27	.48	.27	.49	.57	.60	.73
07JH	SLH	.43	.79	.70	.76	.74	.73	.70	.76
07JH	FRL	.46	.82	.71	.81	.75	.69	.70	.74
07JH	FRH	.40	.52	.40	.33	.36	.39	.48	.33
07JH	FCL	.38	.62	.43	.60	.48	.45	.41	.47
07JH	FCH	.32	.26	.36	.49	.30	.40	.39	.40
07JH	FLL	.28	.32	.32	.22	.41	.33	.30	.39
07JH	FLH	.32	.34	.32	.29	.27	.33	.32	.35
08JH	SRL	.88	.48	.68	.67	.67	.71	.72	.63
08JH	SRH	.82	.80	.83	.89	.87	.80	.82	.84
08JH	SCL	.31	.39	.39	.30	.37	.64	.39	.36
08JH	SCH	.57	.62	.68	.68	.73	.67	.77	.70
08JH	SLL	.43	.31	.38	.46	.45	.43	.30	.38
08JH	SLH	.44	.58	.52	.52	.58	.56	.51	.51
08JH	FRL	.81	.75	.75	.79	.72	.71	.73	.75
08JH	FRH	.75	.81	.73	.73	.63	.72	.77	.72

RAW SCORES--REACTION TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
08JH	FCL	.47	.60	.47	.40	.47	.45	.47	.41
08JH	FCH	.71	.53	.56	.57	.56	.50	.54	.54
08JH	FLL	.36	.37	.30	.37	.23	.29	.22	.24
08JH	FLH	.32	.37	.30	.34	.28	.27	.32	.26
09JH	SRL	.71	.81	.74	.68	.62	.68	.64	.55
09JH	SRH	.68	.69	.61	.50	.60	.60	.52	.57
09JH	SCL	.42	.63	.67	.41	.51	.51	.49	.54
09JH	SCH	.69	.74	.77	.79	.70	.72	.62	.72
09JH	SLL	.40	.33	.33	.34	.23	.30	.30	.22
09JH	SLH	.34	.32	.25	.20	.25	.27	.35	.27
09JH	FRL	.42	.68	.68	.55	.62	.62	.67	.47
09JH	FRH	.51	.36	.46	.40	.39	.40	.42	.32
09JH	FCL	.52	.50	.63	.55	.51	.55	.55	.56
09JH	FCH	.45	.39	.47	.40	.37	.38	.30	.30
09JH	FLL	.37	.32	.36	.23	.21	.29	.29	.32
09JH	FLH	.31	.33	.35	.24	.25	.30	.26	.31
10JL	SRL	.86	.59	.29	.49	.46	.36	.24	.40
10JL	SRH	.70	.72	.32	.12	.39	.11	.12	.35
10JL	SCL	.87	.61	.77	.13	.59	.48	.57	.72
10JL	SCH	.80	.59	.80	.18	.53	.51	.25	.62
10JL	SLL	.50	.46	.39	.19	.35	.25	.27	.39
10JL	SLH	.42	.43	.44	.47	.40	.40	.34	.21
10JL	FRL	.52	.52	.67	.45	.50	.58	.53	.19
10JL	FRH	.60	.37	.38	.13	.28	.11	.25	.14
10JL	FCL	.44	.52	.48	.48	.43	.40	.43	.19
10JL	FCH	.51	.56	.32	.21	.33	.36	.22	.35
10JL	FLL	.49	.45	.34	.22	.29	.28	.21	.27
10JL	FLH	.51	.45	.42	.43	.42	.34	.44	.37
11JL	SRL	.98	.85	1.19	.88	.90	.60	.72	.69
11JL	SRH	1.07	1.03	1.04	1.04	.67	.58	.77	.81
11JL	SCL	.87	.83	.93	.87	.67	.83	.75	.76
11JL	SCH	.85	.85	1.03	.82	.87	.55	.69	.77
11JL	SLL	.67	.54	.60	.62	.60	.41	.36	.53
11JL	SLH	.58	.84	.76	.93	.86	.84	.88	.60
11JL	FRL	.98	.94	1.19	.93	.83	.96	.89	.98
11JL	FRH	.72	.92	.92	.92	.97	.76	.65	1.00
11JL	FCL	.72	.85	.96	.87	.85	.79	.85	.74
11JL	FCH	.90	.75	.73	.90	1.29	.75	.63	.75
11JL	FLL	.62	.37	.72	.39	.37	.34	.47	.37
11JL	FLH	.86	.51	.59	.38	.75	.51	.54	.60
12JL	SRL	.55	.99	1.33	1.44	1.40	1.46	1.32	1.39
12JL	SRH	.75	.94	.91	.75	.76	.87	.69	.76
12JL	SCL	.65	.64	1.19	.41	.46	.51	.55	.54
12JL	SCH	.71	1.21	.88	.82	.59	.95	.86	.87
12JL	SLL	.59	.60	.56	.50	.46	.32	.44	.58
12JL	SLH	.47	.61	.48	.55	.55	.70	.52	.55
12JL	FRL	.82	1.00	.86	.48	.65	.71	.83	.84
12JL	FRH	.90	.96	1.04	.79	.63	.73	.76	.79

RAW SCORES--REACTION TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
12JL	FCL	.47	.72	.41	.40	.56	.42	.69	.46
12JL	FCH	.56	.46	.98	.79	.54	.54	.40	.56
12JL	FLL	.57	.55	.50	.57	.39	.27	.46	.57
12JL	FLH	.54	.40	.55	.48	.25	.85	.46	.50
13JL	SRL	.85	.87	.86	1.05	.83	.80	.84	.78
13JL	SRH	.87	1.00	.97	.82	.88	.32	.88	.81
13JL	SCL	.35	.58	.71	1.08	.36	.33	.65	.32
13JL	SCH	.86	.88	.97	.86	.61	.60	.93	.24
13JL	SLL	.39	.53	.45	.52	.30	.33	.35	.34
13JL	SLH	.39	.53	.51	.42	.38	.33	.35	.37
13JL	FRL	.95	.94	.83	1.11	.91	.82	.35	.99
13JL	FRH	.76	.79	.92	.46	.73	.78	.60	.92
13JL	FCL	.53	.55	.58	.51	.30	.56	.42	.37
13JL	FCH	.39	.60	.59	.34	.34	.41	.32	.37
13JL	FLL	.54	.47	.55	.55	.66	.31	.32	.53
13JL	FLH	.56	.57	.55	.57	.56	.29	.24	.47
14JL	SRL	.37	.39	.47	.51	.27	.36	.36	.23
14JL	SRH	.38	1.06	.81	.27	.72	.32	.27	.30
14JL	SCL	.61	.27	.64	.31	.29	.29	.23	.35
14JL	SCH	.69	.72	.56	1.00	.63	.75	.79	.89
14JL	SLL	.54	.61	.51	.37	.33	.32	.27	.29
14JL	SLH	.49	.51	.51	.33	.30	.39	.41	.37
14JL	FRL	.93	.87	.87	.51	.81	.83	.78	.77
14JL	FRH	.79	.88	.83	.72	.79	.75	.59	.76
14JL	FCL	.40	.41	.95	.31	.54	.47	.26	.49
14JL	FCH	.38	.46	.40	.39	.33	.36	.30	.40
14JL	FLL	.38	.35	.44	.38	.71	.34	.38	.29
14JL	FLH	1.01	.48	.51	.39	.59	.58	.66	.50
15JL	SRL	.81	.80	.79	.24	.84	.81	.87	.86
15JL	SRH	.86	.76	.87	.33	.89	.75	.78	.75
15JL	SCL	.81	.36	.39	.45	.58	.39	.25	.31
15JL	SCH	.48	.52	.57	.49	.46	.37	.40	.28
15JL	SLL	.46	.48	.29	.45	.71	.45	.79	.49
15JL	SLH	.50	.42	.50	.55	.68	.56	.52	.71
15JL	FRL	.67	.36	.68	.19	.31	.31	.29	.21
15JL	FRH	.26	.64	.44	.26	.20	.25	.22	.20
15JL	FCL	.63	.35	.27	.21	.50	.39	.34	.37
15JL	FCH	.40	.49	.61	.36	.32	.37	.28	.37
15JL	FLL	.28	.51	.44	.67	.59	.50	.78	.49
15JL	FLH	.54	.37	.67	.37	.30	.38	.59	.38
16JL	SRL	.39	.85	.63	.40	.66	.61	.55	.67
16JL	SRH	.80	.40	.67	.63	.50	.74	.82	.74
16JL	SCL	.53	.86	.74	.33	.40	.49	.67	.48
16JL	SCH	.71	.25	.31	.70	.56	.65	.69	.65
16JL	SLL	.50	.48	.48	.48	.44	.31	.38	.41
16JL	SLH	.49	.21	.38	.35	.28	.26	.22	.25
16JL	FRL	.65	.66	.59	.68	.66	.63	.60	.64
16JL	FRH	.33	.59	.41	.30	.37	.34	.35	.36

RAW SCORES--REACTION TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
16JL	FCL	.41	.55	.44	.40	.38	.38	.38	.39
16JL	FCH	.42	.43	.43	.54	.48	.51	.52	.46
16JL	FLL	.27	.40	.38	.38	.35	.34	.38	.39
16JL	FLH	.55	.46	.49	.45	.40	.46	.48	.47
17JL	SRL	.55	.56	.88	.57	.45	.71	.27	.35
17JL	SRH	.53	.52	.66	.66	.34	.51	.43	.43
17JL	SCL	.48	.45	.52	.60	.44	.55	.42	.46
17JL	SCH	.49	.57	.53	.50	.38	.40	.46	.43
17JL	SLL	.38	.33	.50	.58	.33	.35	.37	.35
17JL	SLH	.45	.44	.59	.44	.41	.46	.42	.48
17JL	FRL	.39	.43	.33	.31	.48	.24	.27	.20
17JL	FRH	.70	.61	.77	.71	.76	.59	.70	.74
17JL	FCL	.44	.51	.42	.44	.33	.43	.57	.30
17JL	FCH	.40	.42	.41	.45	.44	.35	.34	.42
17JL	FLL	.54	.55	.51	.61	.54	.56	.57	.54
17JL	FLH	.36	.32	.51	.37	.32	.32	.38	.30
18JL	SRL	.54	.38	.42	.49	.36	.33	.27	.32
18JL	SRH	.64	.36	.37	.30	.37	.27	.31	.29
18JL	SCL	.38	.35	.46	.54	.32	.41	.51	.34
18JL	SCH	.41	.40	.36	.40	.27	.37	.20	.45
18JL	SLL	.41	.36	.33	.39	.23	.24	.44	.23
18JL	SLH	.35	.32	.34	.34	.50	.23	.33	.32
18JL	FRL	.33	.29	.25	.50	.27	.25	.43	.26
18JL	FRH	.63	.75	.80	.87	.40	.70	.77	.72
18JL	FCL	.41	.40	.42	.33	.27	.38	.48	.38
18JL	FCH	.32	.29	.32	.42	.33	.32	.27	.28
18JL	FLL	.38	.39	.38	.38	.34	.44	.46	.44
18JL	FLH	.33	.40	.39	.34	.40	.44	.30	.49
19HH	SRL	.40	.43	.45	.80	.71	.74	.61	.71
19HH	SRH	.81	.45	.46	.15	.23	.23	.36	.17
19HH	SCL	.30	.40	.34	.18	.36	.56	.33	.18
19HH	SCH	.46	.55	.34	.21	.59	.51	.41	.19
19HH	SLL	.45	.34	.32	.20	.15	.17	.26	.16
19HH	SLH	.39	.34	.30	.20	.21	.20	.27	.22
19HH	FRL	.68	.28	.31	.32	.25	.22	.33	.28
19HH	FRH	.29	.43	.39	.21	.22	.21	.29	.27
19HH	FCL	.71	.35	.32	.25	.22	.20	.33	.25
19HH	FCH	.43	.38	.37	.30	.23	.24	.31	.21
19HH	FLL	.30	.28	.27	.24	.19	.18	.24	.20
19HH	FLH	.35	.36	.28	.16	.15	.18	.24	.18
20HH	SRL	.72	.57	.67	.62	.57	.57	.58	.61
20HH	SRH	.61	.65	.59	.65	.60	.57	.62	.61
20HH	SCL	.35	.33	.58	.30	.60	.65	.64	.49
20HH	SCH	.45	.42	.37	.59	.46	.33	.33	.38
20HH	SLL	.71	.33	.37	.27	.23	.84	.38	.48
20HH	SLH	.25	.37	.28	.24	.31	.77	.22	.35
20HH	FRL	.47	.42	.64	.33	.59	.48	.42	.48
20HH	FRH	.40	.45	.38	.41	.55	.46	.62	.47
20HH	FCL	.40	.30	.30	.32	.33	.37	.38	.34

RAW SCORES--REACTION TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
20HH	FCH	.38	.34	.44	.36	.32	.31	.35	.36
20HH	FLL	.33	.23	.22	.35	.27	.24	.24	.27
20HH	FLH	.26	.26	.31	.39	.29	.36	.29	.31
21HH	SRL	.54	.69	.49	.67	.70	.37	.62	.27
21HH	SRH	.67	.62	.18	.34	.55	.41	.25	.24
21HH	SCL	.36	.32	.25	.26	.40	.57	.48	.26
21HH	SCH	.41	.17	.43	.32	.43	.30	.12	.18
21HH	SLL	.23	.20	.17	.20	.21	.25	.22	.23
21HH	SLH	.30	.23	.29	.20	.20	.20	.24	.21
21HH	FRL	.51	.45	.41	.35	.62	.62	.35	.28
21HH	FRH	.34	.33	.31	.25	.25	.23	.23	.28
21HH	FCL	.34	.29	.33	.34	.25	.31	.22	.30
21HH	FCH	.24	.23	.22	.18	.28	.27	.24	.23
21HH	FLL	.27	.24	.27	.23	.22	.23	.21	.24
21HH	FLH	.23	.25	.26	.26	.19	.23	.19	.25
22HH	SRL	.71	.67	.71	.56	.67	.77	.58	.66
22HH	SRH	.50	.72	.50	.51	.61	.53	.09	.60
22HH	SCL	.47	.37	.50	.28	.21	.57	.18	.38
22HH	SCH	.37	.46	1.00	.19	.11	.17	.41	.39
22HH	SLL	.33	.26	.33	.37	.19	.23	.22	.13
22HH	SLH	.31	.36	.25	.31	.22	.25	.14	.15
22HH	FRL	.65	.64	.54	.42	.19	.24	.41	.27
22HH	FRH	.40	.37	.23	.15	.19	.18	.19	.24
22HH	FCL	.45	.37	.34	.11	.11	.24	.23	.17
22HH	FCH	.42	.31	.25	.16	.18	.12	.24	.26
22HH	FLL	.36	.34	.26	.14	.22	.16	.12	.13
22HH	FLH	.20	.39	.30	.23	.08	.09	.16	.15
23HH	SRL	.26	.75	.30	.25	.17	.17	.23	.27
23HH	SRH	.36	.71	.38	.47	.23	.20	.20	.47
23HH	SCL	.54	.27	.35	.45	.20	.24	.52	.20
23HH	SCH	.31	.29	.25	.26	.21	.24	.20	.24
23HH	SLL	.27	.25	.24	.27	.22	.25	.25	.17
23HH	SLH	.40	.30	.30	.34	.28	.29	.20	.26
23HH	FRL	.34	.44	.32	.22	.50	.27	.23	.24
23HH	FRH	.25	.28	.25	.22	.26	.26	.20	.31
23HH	FCL	.32	.45	.29	.25	.23	.26	.27	.22
23HH	FCH	.27	.25	.25	.32	.23	.25	.22	.20
23HH	FLL	.22	.25	.23	.30	.25	.25	.19	.18
23HH	FLH	.31	.27	.28	.32	.27	.26	.25	.28
24HH	SRL	.34	.29	.34	.34	.32	.20	.28	.22
24HH	SRH	.26	.63	.84	.89	.55	.54	.76	.58
24HH	SCL	.35	.49	.50	.44	.49	.89	.36	.43
24HH	SCH	.33	.49	.36	.79	.22	.80	.46	.48
24HH	SLL	.26	.40	.44	.29	.29	.43	.65	.45
24HH	SLH	.33	.46	.51	.33	.44	.56	.45	.59
24HH	FRL	.35	.27	.26	.31	.24	.29	.25	.20
24HH	FRH	.24	.29	.30	.34	.36	.26	.26	.28
24HH	FCL	.31	.42	.39	.60	.40	.49	.33	.40

RAW SCORES--REACTION TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
24HH	FCH	.42	.34	.44	.33	.31	.32	.32	.25
24HH	FLL	.32	.36	.30	.29	.31	.40	.46	.47
24HH	FLH	.31	.31	.33	.30	.27	.40	.28	.28
25HH	SRL	.77	.67	.67	.59	.36	.25	.30	.52
25HH	SRH	.92	.61	.73	.35	.30	.84	.63	.49
25HH	SCL	.73	.56	.54	.44	.52	.38	.68	.56
25HH	SCH	.66	.47	.62	.59	.33	.32	.27	.47
25HH	SLL	.50	.37	.38	.33	.21	.21	.22	.32
25HH	SLH	.63	.40	.50	.43	.26	.37	.33	.28
25HH	FRL	.35	.29	.29	.26	.26	.28	.27	.35
25HH	FRH	.50	.37	.37	.42	.38	.32	.33	.27
25HH	FCL	.53	.52	.39	.61	.64	.51	.31	.50
25HH	FCH	.71	.41	.52	.30	.57	.27	.23	.29
25HH	FLL	.52	.39	.40	.41	.39	.30	.37	.34
25HH	FLH	.42	.39	.37	.57	.29	.37	.29	.24
26HH	SRL	.26	.33	.33	.22	.22	.23	.30	.27
26HH	SRH	.35	.35	.35	.31	.26	.25	.23	.70
26HH	SCL	.44	.33	.49	.34	.20	.36	.46	.38
26HH	SCH	.32	.49	.37	.46	.20	.28	.22	.25
26HH	SLL	.50	.63	.49	.71	.22	.30	.32	.59
26HH	SLH	.57	.59	.58	.40	.23	.26	.27	.30
26HH	FRL	.36	.26	.28	.30	.18	.20	.26	.27
26HH	FRH	.37	.33	.23	.25	.21	.29	.20	.24
26HH	FCL	.53	.27	.50	.17	.31	.29	.33	.21
26HH	FCH	.30	.28	.33	.21	.31	.23	.25	.27
26HH	FLL	.27	.42	.21	.25	.21	.25	.30	.27
26HH	FLH	.34	.22	.30	.23	.28	.33	.26	.28
27HH	SRL	.27	.87	.35	.26	.35	.36	.22	.23
27HH	SRH	.29	.28	.51	.49	.20	.15	.21	.19
27HH	SCL	.30	.22	.26	.15	.18	.19	.14	.21
27HH	SCH	.25	.20	.23	.21	.23	.23	.18	.30
27HH	SLL	.25	.23	.22	.13	.19	.20	.19	.19
27HH	SLH	.30	.27	.23	.24	.56	.54	.25	.34
27HH	FRL	.39	.44	.21	.16	.25	.22	.18	.16
27HH	FRH	.25	.49	.21	.15	.23	.17	.25	.25
27HH	FCL	.32	.25	.30	.24	.22	.18	.23	.25
27HH	FCH	.24	.25	.22	.20	.23	.19	.22	.22
27HH	FLL	.31	.30	.27	.24	.20	.18	.23	.25
27HH	FLH	.23	.24	.18	.20	.18	.13	.19	.19
28HL	SRL	.65	.62	.55	.43	.31	.29	.25	.33
28HL	SRH	1.03	.44	.71	.39	.29	.25	.20	.21
28HL	SCL	.66	.44	.33	.47	.23	.65	.55	.40
28HL	SCH	.39	.92	.61	.46	.70	.46	.59	.72
28HL	SLL	.38	.32	.57	.41	.60	.80	.61	.87
28HL	SLH	.28	.44	.32	.31	.64	.30	.53	.71
28HL	FRL	.16	.79	.75	.24	.20	.37	.19	.28
28HL	FRH	.40	.39	.83	.56	.20	.25	.29	.19
28HL	FCL	.42	.62	.49	.34	.28	.39	.60	.81

RAW SCORES--REACTION TIME (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
28HL	FCH	.35	.32	.52	.45	.70	.58	.27	.40
28HL	FLL	.22	.34	.36	.60	.69	.69	.60	.50
28HL	FLH	.30	.40	.43	.32	.25	.81	.61	.34
29HL	SRL	.64	.72	.72	.70	.66	.84	.57	.78
29HL	SRH	.88	.82	.78	.75	.72	.55	.91	.82
29HL	SCL	.55	.66	.65	.69	.65	.56	.70	.73
29HL	SCH	.39	.62	.71	.69	.67	.60	.55	.70
29HL	SLL	.46	.52	.49	.31	.42	.41	.35	.40
29HL	SLH	.32	.98	.54	.46	.52	.33	.50	.48
29HL	FRL	1.00	.75	.71	.72	.69	.68	.77	.66
29HL	FRH	.78	1.09	.95	.65	.81	.68	.49	.83
29HL	FCL	.67	.60	.62	.57	.60	.53	.50	.50
29HL	FCH	.50	.53	.58	.56	.60	.54	.62	.52
29HL	FLL	.49	.37	.36	.43	.30	.36	.35	.31
29HL	FLH	.40	.44	.56	.40	.42	.41	.38	.50
30HL	SRL	1.04	1.19	.82	.68	.85	.68	.72	.82
30HL	SRH	.65	1.00	.68	.38	.65	.27	.86	.67
30HL	SCL	.44	.86	.70	.46	.27	.28	.22	.28
30HL	SCH	.91	.51	.51	.28	.21	.25	.31	.43
30HL	SLL	.90	.28	.35	.38	.25	.16	.22	.22
30HL	SLH	.38	.44	.91	.35	.23	.27	.24	.23
30HL	FRL	.85	.62	.76	.64	.67	.72	.36	.35
30HL	FRH	.91	.92	.52	.59	.74	.44	.33	.29
30HL	FCL	1.03	.41	.55	.32	.29	.24	.23	.20
30HL	FCH	.58	.53	.30	.30	.22	.35	.27	.25
30HL	FLL	.33	.42	.35	.24	.29	.22	.24	.22
30HL	FLH	.30	.28	.37	.33	.20	.25	.27	.25
31HL	SRL	.39	.34	.25	.26	.27	.25	.25	.26
31HL	SRH	.48	.46	.49	.43	.23	.23	.26	.24
31HL	SCL	.35	.59	.68	.36	.25	.20	.12	.23
31HL	SCH	.80	.43	.43	.65	.26	.26	.28	.18
31HL	SLL	.78	.73	.72	.54	.45	.55	.58	.62
31HL	SLH	.75	.47	.80	.30	.54	.64	.40	.45
31HL	FRL	.28	.39	.35	.35	.24	.20	.25	.20
31HL	FRH	.30	.42	.34	.25	.21	.28	.21	.20
31HL	FCL	.57	.73	.67	.29	.26	.23	.25	.31
31HL	FCH	.46	.40	.35	.29	.39	.25	.32	.21
31HL	FLL	.53	.65	.51	.29	.24	.43	.35	.44
31HL	FLH	.42	.23	.25	.24	.35	.43	.26	.44
32HL	SRL	.94	.78	.79	.56	.73	.58	.71	.74
32HL	SRH	1.19	.75	.81	.52	.69	.48	.62	.45
32HL	SCL	.62	.39	.44	.29	.53	.38	.44	.45
32HL	SCH	.58	.59	.52	.82	.47	.51	.26	.42
32HL	SLL	.36	.34	.52	.36	.25	.30	.38	.21
32HL	SLH	.67	.38	.37	.33	.34	.24	.30	.41
32HL	FRL	.83	.67	.60	.64	.61	.73	.46	.56
32HL	FRH	.60	.51	.97	.54	.35	.56	.43	.38
32HL	FCL	.37	.44	.41	.49	.40	.31	.29	.52
32HL	FCH	.33	.49	.47	.44	.44	.45	.44	.47

RAW SCORES--REACTION TIMES (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
32HL	FLL	.31	.39	.33	.34	.36	.30	.30	.28
32HL	FLH	.39	.32	.30	.38	.30	.27	.20	.25
33HL	SRL	.52	.54	.62	.53	.47	.50	.61	.66
33HL	SRH	.27	.32	.45	.49	.56	.62	.55	.66
33HL	SCL	.26	.47	.29	.44	.49	.46	.63	.51
33HL	SCH	.70	.64	.42	.52	.43	.51	.54	.37
33HL	SLL	.44	.52	.28	.37	.29	.32	.37	.37
33HL	SLH	.47	.34	.43	.33	.30	.43	.34	.39
33HL	FRL	.44	.64	.59	.60	.59	.63	.53	.59
33HL	FRH	.29	.70	.40	.54	.60	.62	.55	.60
33HL	FCL	.57	.30	.48	.47	.43	.50	.59	.52
33HL	FCH	.64	.54	.65	.60	.64	.60	.50	.65
33HL	FLL	.27	.31	.27	.32	.36	.41	.23	.37
33HL	FLH	.32	.28	.41	.40	.37	.48	.52	.50
34HL	SRL	.83	.37	.74	.97	.79	.86	.79	.58
34HL	SRH	.87	.80	.94	.83	.71	.75	.75	.74
34HL	SCL	.77	.79	.51	.60	.64	.69	.60	.55
34HL	SCH	.31	1.10	.59	.62	.77	.70	.77	.63
34HL	SLL	.36	.46	.41	.37	.43	.41	.39	.47
34HL	SLH	.26	.59	.89	.83	.75	.67	.82	.57
34HL	FRL	.89	.92	.99	.73	.69	.69	.80	.71
34HL	FRH	.90	.86	.97	.86	.80	.56	.85	.54
34HL	FCL	.95	.68	.67	.58	.75	.61	.61	.74
34HL	FCH	.32	.41	1.04	.63	.39	.77	.47	.64
34HL	FLL	.27	.37	.46	.49	.44	.36	.54	.45
34HL	FLH	.40	.26	.48	.45	.71	.42	.49	.93
35HL	SRL	.86	.61	.71	.85	.86	.82	.55	.42
35HL	SRH	.64	.87	.90	.87	.24	.71	.60	.29
35HL	SCL	.81	.72	.61	.68	.63	.56	.53	.48
35HL	SCH	.90	.48	.67	.32	.27	.56	.49	.76
35HL	SLL	.60	.57	.42	.42	.23	.43	.36	.42
35HL	SLH	.42	.56	.35	.35	.22	.26	.31	.31
35HL	FRL	.65	.79	.77	.53	.72	.77	.33	.64
35HL	FRH	.43	.60	.79	.54	.28	.80	.46	.39
35HL	FCL	.41	.74	.47	.57	.37	.31	.48	.41
35HL	FCH	.61	.47	.60	.48	.44	.37	.43	.36
35HL	FLL	.37	.44	.41	.34	.33	.24	.31	.30
35HL	FLH	.28	.37	.51	.40	.37	.37	.35	.33
36HL	SRL	.94	.90	.65	.78	.57	.94	.82	.85
36HL	SRH	.88	.69	.61	.63	.73	.71	.51	.75
36HL	SCL	.51	.28	.48	.51	.68	.54	.59	.73
36HL	SCH	.60	.53	.96	.80	.27	.63	.52	.50
36HL	SLL	.33	.30	.31	.36	.34	.30	.34	.33
36HL	SLH	.43	.37	.26	.40	.74	.38	.40	.44
36HL	FRL	.93	.95	.84	.86	.92	.62	.93	.65
36HL	FRH	.95	.69	.64	.72	.49	.44	.91	.70
36HL	FCL	.39	.46	.40	.45	.38	.71	.60	.29
36HL	FCH	.46	.27	.24	.31	.58	.41	.99	.45

RAW SCORES--REACTION TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
36HL	FLL	.28	.36	.25	.29	.37	.54	.49	.39
36HL	FLH	.31	.43	.20	.21	.29	.29	.32	.27
37CH	SRL	.27	.61	.58	.48	.83	.47	.26	.27
37CH	SRH	.50	.25	.29	.32	.29	.33	.26	.28
37CH	SCL	.48	.20	.24	.36	.27	.37	.38	.63
37CH	SCH	.38	.57	.22	.61	.43	.60	.43	.42
37CH	SLL	.28	.27	.24	.25	.29	.27	.27	.19
37CH	SLH	.30	.24	.29	.26	.25	.25	.21	.26
37CH	FRL	.23	.26	.23	.24	.20	.24	.26	.26
37CH	FRH	.27	.24	.25	.25	.23	.24	.27	.19
37CH	FCL	.32	.32	.27	.26	.23	.27	.21	.25
37CH	FCH	.34	.34	.40	.31	.27	.32	.28	.24
37CH	FLL	.27	.29	.27	.26	.27	.27	.28	.22
37CH	FLH	.30	.22	.24	.23	.22	.25	.19	.27
38CH	SRL	.28	.84	.78	.70	.76	.68	.70	.81
38CH	SRH	.67	.69	.86	.79	.85	.78	.87	.84
38CH	SCL	.50	.40	.44	.51	.55	.53	.59	.67
38CH	SCH	.56	.57	.50	.55	.55	.54	.67	.45
38CH	SLL	.25	.20	.24	.27	.28	.26	.27	.21
38CH	SLH	.27	.28	.23	.23	.23	.27	.23	.22
38CH	FRL	.77	.47	.48	.48	.35	.52	.44	.46
38CH	FRH	.73	.45	.43	.46	.33	.43	.33	.45
38CH	FCL	.33	.43	.35	.34	.36	.41	.33	.38
38CH	FCH	.32	.36	.30	.27	.26	.32	.26	.28
38CH	FLL	.26	.21	.33	.25	.32	.28	.27	.20
38CH	FLH	.58	.25	.24	.25	.20	.35	.23	.27
39CH	SRL	.25	.46	.67	.42	.38	.39	.45	.38
39CH	SRH	.43	.47	.35	.43	.41	.41	.38	.32
39CH	SCL	.37	.33	.34	.39	.33	.29	.36	.31
39CH	SCH	.32	.41	.42	.38	.35	.27	.38	.33
39CH	SLL	.28	.36	.30	.29	.33	.33	.34	.31
39CH	SLH	.32	.26	.34	.23	.30	.27	.29	.26
39CH	FRL	.62	.33	.37	.27	.32	.33	.29	.27
39CH	FRH	.45	.29	.45	.31	.38	.32	.33	.35
39CH	FCL	.33	.27	.42	.33	.36	.24	.29	.26
39CH	FCH	.36	.34	.31	.33	.29	.24	.27	.26
39CH	FLL	.22	.25	.31	.26	.26	.27	.27	.25
39CH	FLH	.30	.32	.27	.28	.29	.25	.27	.27
40CH	SRL	.73	.70	.63	.65	.63	.50	.56	.61
40CH	SRH	.34	.67	.73	.42	.51	.59	.49	.43
40CH	SCL	.24	.24	.34	.30	.26	.27	.27	.29
40CH	SCH	.35	.25	.34	.31	.32	.30	.27	.25
40CH	SLL	.28	.31	.25	.28	.26	.25	.25	.21
40CH	SLH	.42	.27	.26	.26	.28	.25	.36	.42
40CH	FRL	.34	.54	.50	.40	.46	.34	.35	.34
40CH	FRH	.26	.40	.43	.32	.36	.26	.27	.30
40CH	FCL	.34	.31	.25	.28	.27	.25	.28	.32
40CH	FCH	.40	.29	.26	.30	.30	.31	.32	.32

RAW SCORES--REACTION TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
40CH	FLL	.36	.26	.20	.27	.29	.25	.25	.25
40CH	FLH	.29	.28	.27	.27	.25	.23	.24	.24
41CH	SRL	.53	.38	.36	.35	.36	.32	.39	.31
41CH	SRH	.29	.25	.22	.30	.39	.29	.29	.28
41CH	SCL	.22	.48	.46	.36	.25	.24	.22	.30
41CH	SCH	.43	.45	.25	.25	.25	.24	.23	.25
41CH	SLL	.29	.30	.29	.25	.22	.27	.28	.21
41CH	SLH	.55	.23	.27	.28	.28	.26	.25	.24
41CH	FRL	.29	.32	.29	.26	.21	.22	.22	.23
41CH	FRH	.30	.20	.21	.22	.23	.27	.29	.20
41CH	FCL	.25	.23	.32	.30	.25	.25	.27	.28
41CH	FCH	.22	.23	.28	.25	.23	.26	.29	.27
41CH	FLL	.24	.21	.26	.25	.25	.25	.26	.28
41CH	FLH	.29	.32	.22	.25	.24	.24	.26	.22
42CH	SRL	.58	.57	.64	.67	.59	.60	.61	.58
42CH	SRH	.51	.50	.52	.52	.53	.55	.56	.54
42CH	SCL	.52	.42	.50	.47	.46	.47	.40	.54
42CH	SCH	.43	.48	.51	.50	.49	.43	.44	.52
42CH	SLL	.32	.39	.25	.28	.31	.33	.39	.42
42CH	SLH	.38	.38	.36	.38	.38	.46	.49	.52
42CH	FRL	.47	.40	.37	.40	.47	.43	.41	.44
42CH	FRH	.26	.45	.35	.36	.38	.39	.39	.30
42CH	FCL	.49	.38	.40	.47	.54	.54	.53	.32
42CH	FCH	.43	.40	.45	.38	.37	.39	.41	.42
42CH	FLL	.35	.35	.27	.30	.33	.30	.29	.28
42CH	FLH	.37	.29	.35	.32	.33	.30	.24	.30
43CH	SRL	.33	.30	.28	.26	.27	.22	.22	.24
43CH	SRH	.40	.37	.31	.29	.22	.26	.21	.15
43CH	SCL	.34	.36	.40	.42	.30	.26	.28	.30
43CH	SCH	.30	.36	.44	.32	.21	.36	.27	.20
43CH	SLL	.65	.61	.55	.35	.52	.30	.28	.28
43CH	SLH	.45	.45	.46	.32	.18	.31	.29	.29
43CH	FRL	.31	.31	.31	.25	.26	.19	.21	.25
43CH	FRH	.30	.32	.31	.33	.26	.23	.25	.26
43CH	FCL	.42	.38	.33	.55	.29	.32	.25	.21
43CH	FCH	.33	.28	.26	.26	.25	.20	.25	.21
43CH	FLL	.37	.35	.32	.25	.25	.41	.33	.18
43CH	FLH	.42	.43	.46	.30	.26	.28	.27	.21
44CH	SRL	.40	.36	.30	.26	.20	.14	.28	.22
44CH	SRH	.41	.34	.20	.22	.32	.20	.18	.22
44CH	SCL	.30	.33	.21	.27	.33	.21	.31	.45
44CH	SCH	.36	.38	.37	.25	.22	.29	.28	.25
44CH	SLL	.30	.31	.31	.33	.36	.31	.32	.29
44CH	SLH	.38	.39	.26	.25	.23	.36	.24	.28
44CH	FRL	.27	.22	.21	.23	.27	.21	.25	.21
44CH	FRH	.28	.25	.31	.23	.19	.28	.20	.25
44CH	FCL	.30	.27	.32	.35	.33	.26	.31	.14
44CH	FCH	.35	.36	.23	.24	.22	.18	.13	.20
44CH	FLL	.37	.46	.13	.25	.25	.25	.18	.19

RAW SCORES--REACTION TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
44CH	FLH	.22	.20	.18	.21	.23	.24	.28	.25
45CH	SRL	.22	.20	.24	.22	.19	.17	.22	.22
45CH	SRH	.33	.22	.25	.25	.24	.22	.20	.27
45CH	SCL	.26	.23	.24	.24	.25	.20	.39	.33
45CH	SCH	.19	.15	.28	.27	.25	.25	.20	.23
45CH	SLL	.53	.65	.30	.36	.41	.57	.35	.32
45CH	SLH	.20	.24	.21	.25	.23	.21	.23	.41
45CH	FRL	.23	.33	.22	.24	.23	.21	.27	.31
45CH	FRH	.23	.28	.27	.25	.23	.21	.36	.28
45CH	FCL	.37	.21	.22	.22	.23	.24	.27	.26
45CH	FCH	.27	.27	.27	.26	.27	.26	.22	.29
45CH	FLL	.18	.19	.21	.23	.26	.26	.33	.33
45CH	FLH	.29	.22	.29	.27	.27	.25	.33	.27
46CL	SRL	.75	.64	.95	.83	.77	.87	.57	.72
46CL	SRH	.79	.53	.77	.69	.61	.58	.57	.54
46CL	SCL	1.19	1.14	1.14	1.07	1.00	.91	1.20	.50
46CL	SCH	.64	.79	.72	.75	.80	1.01	.65	.65
46CL	SLL	.55	.66	.58	.59	.55	.55	.48	.48
46CL	SLH	.83	.54	.50	.47	.43	.38	.39	.30
46CL	FRL	.84	.57	.59	.57	.55	.58	.50	.47
46CL	FRH	.69	.53	.60	.62	.57	.57	.58	.49
46CL	FCL	.79	.94	.60	.63	.70	.77	.71	.60
46CL	FCH	.97	.62	.60	.61	.56	.52	.40	.41
46CL	FLL	.81	.86	.45	.41	.38	.37	.32	.42
46CL	FLH	.75	.78	.34	.40	.46	.54	.48	.47
47CL	SRL	.31	.38	.30	.30	.29	.32	.30	.27
47CL	SRH	.29	.32	.30	.32	.33	.32	.35	.38
47CL	SCL	.75	.32	.57	.60	.96	.58	.60	.58
47CL	SCH	.84	.50	.48	.48	.46	.44	.45	.47
47CL	SLL	.65	.25	.57	.55	.54	.74	.82	.91
47CL	SLH	.25	.25	.24	.26	.83	.33	.31	.29
47CL	FRL	.36	.29	.34	.31	.30	.44	.42	.41
47CL	FRH	.32	.35	.39	.39	.36	.29	.21	.21
47CL	FCL	.43	.26	.23	.30	.81	.38	.36	.32
47CL	FCH	.51	.35	.39	.39	.37	.34	.39	.41
47CL	FLL	.43	.73	.78	.35	.24	.25	.29	.29
47CL	FLH	.25	.23	.27	.40	.72	.20	.22	.19
48CL	SRL	.28	.27	.27	.27	.28	.30	.30	.22
48CL	SRH	.24	.25	.25	.23	.30	.30	.29	.27
48CL	SCL	.21	.22	.36	.62	.39	.37	.34	.51
48CL	SCH	.65	.43	.44	.44	.20	.23	.27	.39
48CL	SLL	.50	.22	.41	.76	.33	.29	.27	.18
48CL	SLH	.19	.35	.28	.25	.16	.19	.24	.75
48CL	FRL	.36	.27	.29	.29	.31	.30	.21	.25
48CL	FRH	.27	.24	.30	.34	.35	.30	.21	.27
48CL	FCL	.25	.52	.40	.33	.40	.37	.33	.42
48CL	FCH	.47	.36	.30	.24	.34	.35	.33	.24
48CL	FLL	.20	.31	.28	.24	.26	.27	.25	.22

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
48CL	FLH	.35	.31	.31	.35	.28	.28	.26	.23
49CL	SRL	.82	1.02	.84	.69	1.03	.71	.78	.82
49CL	SRH	.61	.63	.69	.60	.91	.67	.69	.65
49CL	SCL	.71	.64	.61	.78	.83	.89	.81	.77
49CL	SCH	1.01	.74	.81	.92	.86	.83	.85	.86
49CL	SLL	.58	.99	.60	.62	.66	.54	.67	.58
49CL	SLH	.67	.77	.67	.56	.53	.69	.61	.71
49CL	FRL	.82	.77	.88	.67	.62	.59	.63	.64
49CL	FRH	.49	.68	.60	.66	.68	.76	.72	.70
49CL	FCL	.84	.65	.62	.62	.97	.52	.68	.77
49CL	FCH	.50	.96	.46	.49	.69	.75	.51	.52
49CL	FLL	.42	.50	.41	.49	.48	.56	.49	.53
49CL	FLH	.35	.41	.52	.47	.48	.47	.50	.49
50CL	SRL	.63	.54	.63	.50	.47	.43	.46	.42
50CL	SRH	.68	.58	.58	.31	.63	.58	.55	.60
50CL	SCL	.56	.31	.41	.54	.32	.53	.57	.60
50CL	SCH	.46	.37	.37	.50	.32	.41	.38	.47
50CL	SLL	.36	.25	.25	.26	.16	.31	.30	.27
50CL	SLH	.23	.34	.26	.24	.25	.18	.26	.25
50CL	FRL	.53	.61	.32	.35	.37	.34	.38	.38
50CL	FRH	.65	.61	.65	.23	.27	.27	.30	.30
50CL	FCL	.20	.18	.25	.35	.26	.20	.28	.27
50CL	FCH	.29	.27	.22	.24	.28	.26	.27	.29
50CL	FLL	.22	.21	.21	.23	.26	.30	.30	.29
50CL	FLH	.31	.20	.21	.29	.20	.25	.25	.25
51CL	SRL	.84	.35	.32	.76	.31	.72	.36	.39
51CL	SRH	.53	.52	.78	.68	.47	.52	.50	.57
51CL	SCL	.59	.39	.46	.40	.39	.44	.46	.42
51CL	SCH	.56	.44	.46	.60	.70	.64	.66	.65
51CL	SLL	.52	.68	.59	.66	.65	.54	.60	.63
51CL	SLH	.78	.40	.26	.28	.34	.24	.27	.25
51CL	FRL	.82	.41	.50	.89	.51	.62	.70	.63
51CL	FRH	.87	.78	.68	.67	.52	.56	.56	.60
51CL	FCL	.92	.75	.63	.61	.42	.68	.73	.69
51CL	FCH	.67	.63	.43	.79	.36	.39	.67	.64
51CL	FLL	.43	.91	.72	.24	.31	.31	.36	.35
51CL	FLH	.34	.50	.31	.33	.33	.33	.34	.33
52CL	SRL	.64	.69	.74	.70	.67	.63	.66	.64
52CL	SRH	.98	.73	.86	.65	.59	.65	.65	.68
52CL	SCL	.85	.51	.61	.47	.52	.53	.59	.56
52CL	SCH	.74	.52	.58	.62	.63	.73	.71	.70
52CL	SLL	.27	.27	.34	.26	.33	.39	.36	.35
52CL	SLH	.27	.32	.37	.34	.35	.80	.37	.37
52CL	FRL	.64	.73	.69	.68	.65	.62	.66	.64
52CL	FRH	.74	.76	.65	.65	.62	.68	.68	.66
52CL	FCL	.44	.33	.47	.51	.55	.98	.52	.51
52CL	FCH	.37	.28	.50	.42	.54	.51	.51	.50
52CL	FLL	.48	.27	.31	.30	.47	.40	.43	.41

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
52CL	FLH	.36	.36	.35	.37	.36	.37	.36	.35
53CL	SRL	.36	.30	.28	.25	.31	.33	.35	.27
53CL	SRH	.42	.49	.47	.41	.24	.30	.31	.42
53CL	SCL	.67	.64	.61	.61	.47	.46	.48	.42
53CL	SCH	.88	.72	.66	.65	.53	.60	.60	.63
53CL	SLL	.82	.72	.70	.70	.35	.35	.36	.38
53CL	SLH	.66	.85	.85	.84	.83	.85	.84	.80
53CL	FRL	.43	.38	.37	.31	.34	.36	.34	.30
53CL	FRH	.26	.40	.33	.26	.39	.34	.28	.26
53CL	FCL	.45	.64	.59	.59	.42	.58	.39	.59
53CL	FCH	.78	.57	.56	.53	.38	.52	.50	.34
53CL	FLL	.80	.82	.26	.22	.27	.27	.22	.24
53CL	FLH	.70	.25	.29	.26	.24	.29	.62	.23
54CL	SRL	.35	.84	.79	.68	.80	.78	.62	.53
54CL	SRH	.69	.79	.70	.68	.77	.73	.69	.62
54CL	SCL	.45	.23	.26	.27	.53	.25	.42	.27
54CL	SCH	.62	.64	.64	.64	.62	.62	.63	.50
54CL	SLL	.33	.31	.28	.23	.29	.28	.29	.29
54CL	SLH	.35	.33	.36	.38	.37	.29	.25	.23
54CL	FRL	.87	.74	.66	.48	.76	.73	.66	.76
54CL	FRH	.90	.25	.29	.28	.21	.33	.35	.27
54CL	FCL	.44	.38	.37	.36	.26	.38	.42	.27
54CL	FCH	.47	.41	.42	.45	.30	.41	.49	.35
54CL	FLL	.33	.28	.28	.29	.30	.30	.30	.23
54CL	FLH	.29	.34	.36	.37	.30	.29	.29	.25

RAW SCORES--MOVEMENT TIME

SUBJECT ID	CONDITION	1	2	3	4	5	6	7	8
01JH	SRL	.71	.92	1.10	1.04	1.80	1.53	1.37	1.37
01JH	SRH	.90	1.15	1.50	1.53	1.26	1.54	1.63	1.26
01JH	SCL	1.21	1.27	1.28	1.80	1.44	1.37	1.58	1.42
01JH	SCH	1.10	1.20	1.32	1.40	1.72	1.36	1.49	1.37
01JH	SLL	1.53	1.64	1.50	.97	1.27	1.19	1.48	1.37
01JH	SLH	1.92	1.36	1.74	1.36	1.31	1.24	1.24	1.36
01JH	FRL	1.37	1.28	1.54	1.24	1.35	1.75	1.80	1.35
01JH	FRH	1.64	2.00	2.03	1.71	1.89	2.40	2.12	1.89
01JH	FCL	1.67	1.96	1.85	1.59	1.75	1.27	1.66	1.67
01JH	FCH	2.15	1.86	1.98	1.74	1.94	2.00	1.79	1.79
01JH	FLL	1.91	1.95	1.83	1.74	1.70	1.49	1.45	1.74
01JH	FLH	1.95	1.92	1.75	1.50	1.48	1.83	1.57	1.83
02JH	SRL	1.47	1.36	1.19	1.27	1.17	1.25	1.15	1.25
02JH	SRH	1.36	1.36	1.38	1.33	1.27	1.25	1.32	1.32
02JH	SCL	1.15	1.43	1.24	1.18	1.19	1.17	1.07	1.17
02JH	SCH	1.37	1.51	1.15	1.26	1.28	1.14	1.17	1.15
02JH	SLL	1.25	1.37	1.47	1.37	1.25	1.35	1.21	1.25
02JH	SLH	1.46	1.45	1.40	1.44	1.15	1.47	1.42	1.40
02JH	FRL	1.55	1.51	1.41	1.22	1.45	1.47	1.42	1.45
02JH	FRH	1.38	1.83	1.78	1.37	1.32	1.62	1.65	1.62
02JH	FCL	1.56	1.35	1.36	1.18	1.36	1.32	1.60	1.39
02JH	FCH	1.75	2.00	1.68	1.75	1.53	1.50	1.62	1.69
02JH	FLL	1.14	1.51	1.56	1.33	1.55	1.50	1.70	1.51
02JH	FLH	1.43	1.51	1.62	1.33	1.65	1.57	1.60	1.60
03JH	SRL	1.39	1.26	1.47	1.42	1.28	1.58	1.44	1.50
03JH	SRH	1.13	1.15	1.52	1.27	1.13	1.30	1.23	1.40
03JH	SCL	1.47	1.23	1.25	1.37	1.48	1.48	1.42	1.25
03JH	SCH	1.07	1.12	1.03	1.21	1.28	1.26	1.54	1.18
03JH	SLL	1.59	1.35	1.38	1.39	1.30	1.43	1.30	1.40
03JH	SLH	1.36	1.38	1.37	1.33	1.34	1.22	1.31	1.31
03JH	FRL	1.22	1.15	1.55	1.25	1.32	1.10	1.29	1.11
03JH	FRH	1.51	1.42	1.88	1.50	1.42	1.35	1.48	1.45
03JH	FCL	1.22	1.67	1.46	1.41	1.38	1.36	1.64	1.27
03JH	FCH	1.38	1.83	1.73	1.53	1.40	1.63	1.56	1.23
03JH	FLL	1.69	1.52	1.50	1.51	1.68	1.32	1.45	1.42
03JH	FLH	1.36	1.71	1.74	1.54	1.32	1.56	1.42	1.67
04JH	SRL	1.21	1.11	1.06	1.21	1.46	1.47	1.57	1.56
04JH	SRH	1.43	1.16	1.25	1.49	1.72	1.62	1.67	1.42
04JH	SCL	1.30	1.00	1.31	1.39	1.70	1.62	1.35	1.45
04JH	SCH	1.00	.97	1.14	1.30	1.64	1.26	1.47	1.62
04JH	SLL	1.65	1.50	1.22	1.52	1.58	1.55	1.64	1.50
04JH	SLH	1.32	1.31	1.35	1.44	1.47	1.47	1.52	1.62
04JH	FRL	1.35	1.47	1.65	1.55	1.60	1.54	1.94	1.87
04JH	FRH	1.38	1.77	1.73	1.74	1.77	1.90	1.85	1.79
04JH	FCL	1.39	1.27	1.62	1.57	1.60	1.68	1.74	1.75
04JH	FCH	1.44	1.70	1.50	1.74	1.94	1.84	1.90	1.87
04JH	FLL	1.34	1.43	1.36	1.51	1.57	1.54	1.65	1.67
04JH	FLH	1.34	1.62	1.38	1.56	1.62	1.67	1.66	1.66

RAW SCORES--MOVEMENT TIME (CONT'D)

SUBJECT ID	CONDITION	1	2	3	4	5	6	7	8
05JH	SRL	1.52	1.06	1.30	1.33	1.21	1.10	1.14	1.24
05JH	SRH	1.55	1.65	1.54	.93	1.45	1.62	1.42	1.45
05JH	SCL	1.38	1.29	.96	1.20	.83	1.28	1.10	1.15
05JH	SCH	1.35	1.43	1.43	1.25	1.24	1.17	1.25	1.30
05JH	SLL	1.40	1.64	1.31	1.55	1.74	1.31	1.16	1.44
05JH	SLH	1.46	1.72	1.25	1.28	1.32	1.36	1.25	1.37
05JH	FRL	1.33	1.52	1.26	1.49	1.20	1.29	1.36	1.34
05JH	FRH	1.43	1.63	1.49	1.81	2.06	1.73	2.00	1.73
05JH	FCL	1.63	1.54	1.56	1.52	1.74	1.35	1.45	1.54
05JH	FCH	1.82	1.68	1.65	1.57	1.64	1.59	1.62	1.65
05JH	FLL	1.42	1.74	1.53	1.30	1.32	1.52	1.51	1.47
05JH	FLH	1.36	1.68	1.74	1.54	1.40	1.51	1.55	1.54
06JH	SRL	1.52	1.57	1.32	1.62	1.64	1.68	1.67	1.57
06JH	SRH	2.00	2.13	2.07	1.89	1.97	1.87	1.76	1.96
06JH	SCL	1.75	1.73	1.75	1.63	1.67	1.83	1.78	1.73
06JH	SCH	1.99	1.81	1.52	1.65	1.79	1.51	1.79	1.72
06JH	SLL	1.80	1.53	1.39	1.31	1.32	1.60	1.64	1.51
06JH	SLH	1.96	1.40	1.57	1.57	1.53	1.70	1.52	1.59
06JH	FRL	1.85	1.88	1.70	1.71	1.72	1.49	1.38	1.70
06JH	FRH	1.98	1.87	1.73	2.05	1.93	1.82	1.60	1.85
06JH	FCL	1.88	1.90	1.92	1.57	1.57	1.43	1.59	1.59
06JH	FCH	1.81	2.01	1.99	1.73	1.68	1.88	1.87	1.85
06JH	FLL	2.04	1.90	1.83	1.74	1.83	1.48	1.63	1.78
06JH	FLH	2.16	2.02	2.02	1.69	1.78	1.85	1.94	1.91
07JH	SRL	1.08	1.05	1.01	.79	.70	.75	1.09	1.04
07JH	SRH	1.23	1.40	.95	1.79	1.36	1.05	.90	.94
07JH	SCL	.94	.88	.98	1.17	.75	1.04	.98	1.12
07JH	SCH	1.00	1.17	1.04	1.00	.96	1.16	1.01	1.02
07JH	SLL	1.10	1.12	1.12	1.52	1.06	1.01	1.07	1.07
07JH	SLH	1.40	1.53	1.34	1.40	1.30	1.37	1.30	1.07
07JH	FRL	1.36	1.09	1.20	1.24	1.20	1.11	1.29	1.20
07JH	FRH	1.69	1.55	1.63	1.66	1.63	1.66	1.65	1.62
07JH	FCL	1.52	1.27	1.43	1.39	1.29	1.33	1.63	1.61
07JH	FCH	1.59	1.37	1.52	1.44	1.46	1.41	1.65	1.72
07JH	FLL	1.61	1.77	1.81	1.72	1.80	1.92	1.86	2.00
07JH	FLH	1.93	1.72	1.70	1.76	1.62	1.53	1.58	1.76
08JH	SRL	1.10	1.30	.97	.93	1.24	.97	.99	.95
08JH	SRH	.85	.95	.94	.90	.81	1.04	.92	1.03
08JH	SCL	.78	.97	.93	.93	.90	.80	1.04	1.08
08JH	SCH	.92	1.03	1.00	1.04	1.03	.91	1.07	1.03
08JH	SLL	1.26	1.25	1.40	1.42	1.16	1.15	1.43	1.45
08JH	SLH	1.15	1.02	1.14	.93	1.20	1.23	1.20	1.26
08JH	FRL	.87	.69	.84	1.08	.82	.71	.87	.84
08JH	FRH	.94	.70	.95	.81	1.01	1.08	1.07	1.05
08JH	FCL	.89	.76	.89	.96	.93	.86	.71	1.15
08JH	FCH	1.15	1.25	1.21	1.27	1.10	1.38	1.15	1.15
08JH	FLL	1.20	1.30	1.30	1.22	1.38	1.34	1.36	1.33
08JH	FLH	1.48	1.44	1.39	1.45	1.30	1.45	1.28	1.38

SUB-JECT ID	CONDI-TION	1	2	3	4	5	6	7	8
09JH	SRL	1.11	.83	.91	1.25	1.40	1.15	1.20	1.35
09JH	SRH	.94	.73	.94	1.05	1.03	.96	1.05	1.01
09JH	SCL	1.13	1.18	1.16	1.15	1.16	1.17	1.23	1.17
09JH	SCH	1.00	1.01	1.13	1.15	1.15	1.12	1.27	1.15
09JH	SLL	1.50	1.40	1.42	1.46	1.50	1.47	1.56	1.45
09JH	SLH	1.13	1.29	1.18	1.16	1.13	1.17	1.16	1.15
09JH	FRL	1.63	1.37	1.37	1.36	1.35	1.37	1.55	1.47
09JH	FRH	1.32	1.58	1.53	1.59	1.65	1.55	1.64	1.54
09JH	FCL	1.47	1.65	1.74	1.47	1.70	1.56	1.52	1.56
09JH	FCH	1.59	1.62	1.47	1.52	1.62	1.62	1.70	1.79
09JH	FLL	1.78	1.48	1.75	1.71	1.76	1.70	1.67	1.69
09JH	FLH	1.87	1.89	1.82	1.57	1.70	1.77	1.80	1.72
10JL	SRL	1.04	1.16	1.69	1.04	1.15	1.50	1.75	1.16
10JL	SRH	1.17	.89	1.51	1.46	1.60	1.61	1.72	1.06
10JL	SCL	.78	.95	.87	.84	.87	1.12	1.37	.97
10JL	SCH	1.76	1.16	1.65	1.69	1.72	1.40	1.73	1.80
10JL	SLL	1.45	1.57	1.75	1.20	1.57	1.60	1.31	2.21
10JL	SLH	1.58	1.32	1.38	1.80	1.52	1.50	1.58	1.72
10JL	FRL	1.17	1.54	1.50	1.54	1.53	1.59	1.70	2.26
10JL	FRH	1.58	1.52	1.70	1.34	1.32	1.85	1.90	1.32
10JL	FCL	1.35	1.39	1.34	1.40	1.37	1.54	1.14	1.28
10JL	FCH	1.72	1.64	1.80	1.72	1.72	2.16	1.90	2.00
10JL	FLL	1.57	1.70	1.58	1.80	1.54	1.56	1.71	1.44
10JL	FLH	1.60	2.01	1.31	1.62	1.60	1.63	1.89	1.78
11JL	SRL	1.22	1.23	.83	1.21	1.65	1.29	1.10	1.45
11JL	SRH	1.83	1.83	1.84	1.87	1.54	1.78	1.20	1.66
11JL	SCL	1.85	1.80	1.88	1.83	1.49	1.90	1.58	1.84
11JL	SCH	1.02	1.06	1.04	1.04	1.50	1.19	1.10	1.05
11JL	SLL	1.36	1.36	1.39	1.11	1.30	1.15	1.37	1.50
11JL	SLH	1.64	1.63	1.62	.95	1.18	1.60	1.50	1.65
11JL	FRL	.99	1.64	.81	1.67	1.96	1.65	1.66	1.59
11JL	FRH	1.53	1.93	1.81	1.69	1.90	1.99	1.91	1.94
11JL	FCL	1.03	1.05	1.06	1.03	1.57	1.18	1.50	1.09
11JL	FCH	.92	1.42	1.46	1.41	1.55	1.41	1.42	1.24
11JL	FLL	1.57	1.39	1.47	1.54	1.37	1.37	1.29	1.50
11JL	FLH	1.39	1.34	1.35	1.38	1.15	1.30	1.36	1.68
12JL	SRL	1.22	.94	.85	.92	.81	1.51	.80	1.10
12JL	SRH	.98	.81	.82	1.60	.95	1.50	1.39	.99
12JL	SCL	.90	1.40	1.00	1.42	1.33	1.47	1.67	1.45
12JL	SCH	1.18	.86	1.42	1.12	1.40	1.26	1.05	1.15
12JL	SLL	1.44	1.46	1.59	1.90	1.70	1.82	2.02	1.58
12JL	SLH	1.56	1.55	1.66	1.81	1.70	1.33	1.51	1.59
12JL	FRL	1.24	1.12	1.58	1.78	1.71	1.79	1.72	1.75
12JL	FRH	1.12	1.24	1.27	1.15	1.46	1.74	1.50	1.26
12JL	FCL	1.52	1.34	1.42	1.42	1.35	1.39	1.29	1.40
12JL	FCH	1.03	2.12	1.51	1.74	1.76	1.95	1.76	1.75
12JL	FLL	1.53	1.53	1.81	1.64	1.61	1.89	1.54	1.55
12JL	FLH	2.17	1.71	1.91	2.06	2.14	1.35	1.56	1.95

RAW SCORES--MOVEMENT TIME (CONT'D)

SUB-JECT ID	CONDI-TION	1	2	3	4	5	6	7	8
13JL	SRL	1.27	1.24	1.04	1.22	1.80	1.37	1.35	1.67
13JL	SRH	1.35	1.20	1.03	1.20	1.70	1.30	1.50	1.31
13JL	SCL	1.60	1.17	1.30	.94	1.60	1.52	1.89	1.58
13JL	SCH	1.90	1.93	1.93	1.93	1.90	1.91	1.98	1.65
13JL	SLL	1.29	1.46	1.47	1.32	1.41	1.21	1.23	1.36
13JL	SLH	1.67	1.68	1.87	1.50	1.89	1.66	1.28	1.37
13JL	FRL	1.31	1.10	1.32	.71	1.18	1.30	1.11	1.33
13JL	FRH	1.26	1.22	1.22	1.26	1.28	1.42	1.63	1.61
13JL	FCL	1.63	1.60	1.66	1.57	1.18	1.61	1.21	1.60
13JL	FCH	1.50	1.52	1.98	1.55	1.57	1.16	1.81	1.45
13JL	FLL	1.55	1.20	1.51	1.57	1.56	1.52	1.15	1.81
13JL	FLH	1.44	1.58	1.39	1.70	1.35	1.29	1.45	1.47
14JL	SRL	.82	1.34	1.37	1.20	1.36	1.38	1.41	1.35
14JL	SRH	.92	.82	1.13	1.20	1.20	1.19	1.18	1.35
14JL	SCL	1.00	.95	1.22	1.29	1.24	1.25	1.39	1.10
14JL	SCH	1.29	1.33	1.59	1.48	1.90	1.86	1.73	1.94
14JL	SLL	1.44	1.31	1.53	1.55	1.50	1.51	1.34	1.97
14JL	SLH	1.19	1.28	1.51	1.53	1.58	1.57	1.55	1.60
14JL	FRL	1.86	1.88	1.96	1.86	1.97	1.89	1.81	1.48
14JL	FRH	1.85	1.74	1.23	1.34	1.35	1.36	1.48	1.37
14JL	FCL	1.62	1.42	1.35	1.46	1.50	1.45	1.40	1.57
14JL	FCH	1.63	1.19	1.90	1.41	1.35	1.37	1.39	1.49
14JL	FLL	1.36	1.36	1.03	1.32	1.31	1.38	1.39	1.40
14JL	FLH	1.80	1.90	1.82	1.39	1.84	1.81	1.87	1.51
15JL	SRL	2.02	1.66	1.75	2.23	1.20	1.99	1.96	1.75
15JL	SRH	1.30	1.73	1.25	1.63	1.85	1.82	1.75	1.91
15JL	SCL	1.36	1.40	1.77	1.46	1.65	1.62	1.92	2.62
15JL	SCH	2.02	1.70	1.32	1.81	2.05	2.01	2.19	2.03
15JL	SLL	1.92	2.07	2.26	2.19	1.64	2.03	1.70	2.04
15JL	SLH	1.91	2.00	1.95	1.92	1.60	1.93	1.97	2.08
15JL	FRL	2.12	2.11	1.58	1.78	1.96	1.94	1.86	1.96
15JL	FRH	1.54	1.74	2.53	2.11	2.13	2.21	2.31	1.90
15JL	FCL	2.68	2.27	2.42	1.88	2.26	2.19	1.94	2.12
15JL	FCH	1.75	1.81	2.32	1.43	1.91	1.87	1.80	1.87
15JL	FLL	2.84	2.46	2.54	2.04	1.71	2.09	1.74	1.94
15JL	FLH	2.43	2.21	1.90	2.17	2.51	2.20	1.88	2.32
16JL	SRL	1.61	1.38	1.06	2.02	1.43	1.11	1.98	1.36
16JL	SRH	.91	1.23	.95	1.22	1.21	1.10	1.36	1.20
16JL	SCL	1.37	1.12	1.09	1.39	1.47	1.36	1.45	1.39
16JL	SCH	1.08	1.53	1.74	1.12	1.18	1.17	1.20	1.16
16JL	SLL	1.65	1.25	1.61	1.49	1.66	1.62	1.59	1.60
16JL	SLH	1.62	1.84	1.37	1.80	2.07	1.58	1.84	1.86
16JL	FRL	1.31	.92	1.02	1.34	1.17	1.31	1.39	1.35
16JL	FRH	1.88	1.67	1.88	1.72	1.64	1.82	1.82	1.80
16JL	FCL	1.74	1.77	1.65	1.66	1.68	2.25	2.30	1.67
16JL	FCH	1.31	1.67	1.71	1.74	2.12	1.73	2.15	1.70
16JL	FLL	1.85	1.81	1.89	1.83	2.15	2.14	1.93	1.83
16JL	FLH	1.82	1.83	1.86	1.78	2.10	2.02	1.64	1.80

RAW SCORES--MOVEMENT TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
17JL	SRL	1.20	1.26	1.22	1.13	1.10	1.22	1.53	1.19
17JL	SRH	1.05	1.02	.99	.99	1.24	1.19	1.05	1.14
17JL	SCL	1.10	.95	1.28	.95	1.15	1.00	1.10	1.02
17JL	SCH	1.19	1.16	1.09	1.18	1.12	1.35	1.38	1.11
17JL	SLL	1.18	1.38	1.39	1.13	1.35	1.17	1.39	1.32
17JL	SLH	1.51	1.50	1.41	1.35	1.50	1.59	1.40	1.30
17JL	FRL	1.53	1.27	1.35	1.31	1.52	1.60	1.65	1.52
17JL	FRH	1.22	1.24	1.20	1.06	1.23	1.20	1.25	1.28
17JL	FCL	1.60	1.61	1.65	1.51	1.62	1.45	1.56	1.62
17JL	FCH	1.69	1.46	1.40	1.71	1.74	1.76	1.64	1.62
17JL	FLL	1.67	1.80	1.71	1.65	1.90	1.65	1.64	1.45
17JL	FLH	1.73	1.42	1.70	1.71	1.63	1.72	1.71	1.75
18JL	SRL	1.43	1.40	1.24	1.15	1.40	1.25	1.41	1.46
18JL	SRH	1.20	1.50	1.58	1.52	1.53	1.51	1.44	1.35
18JL	SCL	1.45	1.42	1.50	1.30	1.27	1.30	1.47	1.35
18JL	SCH	1.39	1.40	1.38	1.45	1.47	1.40	1.35	1.55
18JL	SLL	1.54	1.56	1.41	1.20	1.67	1.57	1.36	1.24
18JL	SLH	1.65	1.39	1.53	1.33	1.35	1.35	1.43	1.37
18JL	FRL	1.43	1.47	1.42	1.48	1.33	1.57	1.15	1.00
18JL	FRH	1.73	1.76	1.45	1.63	1.45	1.65	1.76	1.72
18JL	FCL	1.23	1.46	1.44	1.47	1.20	1.42	1.42	1.32
18JL	FCH	2.16	1.90	1.84	1.65	1.85	1.57	2.03	1.90
18JL	FLL	1.72	1.53	1.52	1.29	1.65	1.52	1.55	1.54
18JL	FLH	1.74	1.70	1.74	1.99	1.47	1.65	1.59	1.69
19HH	SRL	1.56	1.50	1.55	.92	.83	1.51	1.37	1.71
19HH	SRH	1.19	1.92	1.40	1.51	1.39	2.00	1.53	1.34
19HH	SCL	1.25	1.16	1.44	1.26	1.16	.91	1.22	1.38
19HH	SCH	1.51	1.20	1.31	1.46	1.53	1.52	1.27	1.35
19HH	SLL	1.96	1.59	1.74	1.49	1.42	1.59	1.57	1.23
19HH	SLH	1.89	1.56	1.73	1.50	1.55	1.24	1.58	1.56
19HH	FRL	2.17	1.99	1.72	1.31	1.39	1.40	1.61	1.32
19HH	FRH	2.18	1.44	1.81	1.50	1.37	1.66	1.64	1.50
19HH	FCL	2.11	1.60	1.77	1.27	1.29	1.32	1.52	1.26
19HH	FCH	1.90	2.00	1.50	1.23	1.48	1.33	1.56	1.51
19HH	FLL	1.93	1.82	1.80	1.49	1.46	1.51	1.64	1.49
19HH	FLH	2.08	1.87	1.97	1.67	1.61	1.51	1.79	1.84
20HH	SRL	1.09	1.46	1.88	1.37	1.39	.92	1.33	1.35
20HH	SRH	1.32	1.57	1.10	1.39	1.34	1.60	1.40	1.39
20HH	SCL	1.27	1.53	1.39	1.83	1.22	1.81	1.82	1.55
20HH	SCH	1.27	1.45	1.25	1.32	1.44	1.59	1.89	1.46
20HH	SLL	1.29	1.46	1.19	1.50	1.48	1.56	1.71	1.45
20HH	SLH	1.80	1.52	1.51	1.45	2.00	1.70	1.53	1.64
20HH	FRL	1.57	1.55	1.44	1.39	1.55	1.57	1.66	1.53
20HH	FRH	1.77	2.00	1.81	1.45	2.39	1.19	1.42	1.72
20HH	FCL	1.75	1.75	1.86	1.50	1.32	1.57	1.42	1.59
20HH	FCH	2.05	1.97	1.54	1.72	1.77	1.81	1.80	1.81
20HH	FLL	1.41	1.68	1.52	1.33	1.44	1.48	1.51	1.48
20HH	FLH	1.96	1.76	1.72	1.70	1.56	1.81	1.73	1.75

RAW SCORES--MOVEMENT TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
21HH	SRL	1.11	.92	1.06	.89	.98	1.46	1.04	1.39
21HH	SRH	.88	.86	1.50	1.32	1.16	1.17	1.28	1.18
21HH	SCL	1.27	1.07	1.45	1.52	1.25	1.05	1.09	1.47
21HH	SCH	1.09	1.64	1.31	1.18	1.36	1.38	1.67	1.39
21HH	SLL	1.36	1.51	1.54	1.37	1.40	1.19	1.53	1.29
21HH	SLH	1.65	1.48	1.33	1.41	1.38	1.42	1.53	1.64
21HH	FRL	1.40	1.58	1.47	1.41	1.50	1.93	1.77	1.59
21HH	FRH	2.11	1.75	1.71	1.45	1.60	1.75	1.53	1.70
21HH	FCL	1.69	1.54	1.60	1.85	1.50	1.73	1.78	1.67
21HH	FCH	1.96	1.70	2.00	1.60	1.47	1.88	1.77	1.75
21HH	FLL	1.69	1.69	1.61	2.01	1.36	1.52	1.71	1.95
21HH	FLH	1.88	1.90	1.72	1.90	2.02	1.85	2.18	1.60
22HH	SRL	.90	1.18	1.07	.50	.82	.57	.78	.75
22HH	SRH	1.53	1.14	1.64	1.09	.82	.55	.99	.98
22HH	SCL	1.60	1.37	1.48	2.48	1.04	.97	1.02	1.01
22HH	SCH	1.44	1.82	1.09	1.20	1.31	1.01	1.09	1.28
22HH	SLL	1.01	1.30	1.99	1.48	1.20	1.14	1.05	1.20
22HH	SLH	1.70	1.58	1.33	1.59	.97	1.06	1.23	1.17
22HH	FRL	1.87	1.60	1.82	1.44	1.06	1.32	1.11	1.32
22HH	FRH	1.83	1.65	2.26	1.52	1.38	1.15	1.29	1.58
22HH	FCL	1.72	1.64	2.05	1.09	1.29	1.48	1.26	1.34
22HH	FCH	2.28	2.22	2.06	1.24	1.11	1.39	1.65	1.26
22HH	FLL	1.83	2.01	1.98	1.19	1.53	1.17	1.25	1.31
22HH	FLH	1.68	2.29	1.79	2.09	1.36	1.37	1.50	1.34
23HH	SRL	1.39	1.69	1.28	1.21	1.21	1.19	1.00	1.26
23HH	SRH	1.49	1.03	1.26	1.40	1.03	1.05	1.26	1.57
23HH	SCL	1.30	1.36	1.18	1.11	1.21	1.28	.91	1.07
23HH	SCH	1.62	1.73	1.39	1.53	1.46	1.12	1.38	.91
23HH	SLL	1.49	1.70	1.38	1.39	1.20	1.23	1.36	1.29
23HH	SLH	1.69	1.38	1.37	1.52	1.19	1.37	1.22	1.23
23HH	FRL	1.83	1.56	1.55	1.44	1.75	1.27	1.16	1.81
23HH	FRH	1.72	1.90	1.61	1.87	1.46	1.35	1.70	1.25
23HH	FCL	1.54	1.39	1.32	1.28	1.31	1.19	1.25	1.29
23HH	FCH	1.78	1.56	1.46	1.41	1.46	1.44	1.31	1.29
23HH	FLL	1.42	1.88	1.26	1.54	1.17	1.28	1.32	1.18
23HH	FLH	1.62	1.66	1.55	1.76	1.47	1.44	1.51	1.36
24HH	SRL	1.36	1.41	1.52	1.43	1.29	1.73	1.27	1.26
24HH	SRH	1.83	1.64	1.97	1.69	2.09	1.21	1.20	1.51
24HH	SCL	1.51	1.19	1.17	1.23	1.21	.79	1.20	1.23
24HH	SCH	1.66	1.51	1.46	1.14	1.64	1.73	1.22	1.70
24HH	SLL	1.88	1.60	1.43	1.64	1.64	1.36	1.59	1.65
24HH	SLH	1.61	1.40	1.39	1.49	1.27	1.50	1.29	1.23
24HH	FRL	1.34	1.47	1.59	1.43	1.48	1.64	1.47	1.36
24HH	FRH	1.88	1.62	1.77	1.39	1.78	1.39	1.56	1.57
24HH	FCL	1.76	1.67	1.69	1.69	1.61	1.70	1.61	1.66
24HH	FCH	1.86	1.57	1.49	1.50	1.79	1.50	1.31	1.53
24HH	FLL	1.64	1.54	1.43	2.10	1.43	1.32	1.43	1.44
24HH	FLH	1.60	1.40	1.42	1.55	1.35	1.22	1.36	1.33

RAW SCORES--MOVEMENT TIME

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
25HH	SRL	.97	1.05	1.17	.90	1.23	1.34	1.14	1.11
25HH	SRH	.94	1.26	1.59	1.59	1.29	1.40	.86	1.16
25HH	SCL	1.17	1.24	1.23	1.18	1.00	1.28	.96	1.29
25HH	SCH	1.23	1.37	1.37	1.26	1.37	1.09	1.88	1.37
25HH	SLL	1.47	1.53	1.44	1.23	1.61	1.35	1.45	1.44
25HH	SLH	1.24	1.36	1.29	1.59	1.31	1.24	1.56	1.27
25HH	FRL	1.50	2.21	1.54	1.67	1.33	1.54	1.15	1.38
25HH	FRH	1.74	1.54	1.60	2.01	1.45	1.53	1.47	1.45
25HH	FCL	1.33	1.22	1.90	1.17	1.37	1.30	1.57	1.41
25HH	FCH	1.09	1.41	1.45	1.69	1.38	1.63	1.13	1.47
25HH	FLL	1.17	1.42	1.46	1.87	1.29	1.25	1.38	1.51
25HH	FLH	1.57	1.50	1.86	1.49	1.35	1.61	1.50	1.97
26HH	SRL	1.53	1.33	1.15	1.45	1.29	1.28	1.16	1.31
26HH	SRH	1.68	1.35	1.46	1.35	1.60	1.52	1.18	.68
26HH	SCL	1.58	1.60	.92	1.19	1.34	1.33	1.23	1.31
26HH	SCH	1.39	1.15	1.36	1.48	1.61	1.28	1.38	1.48
26HH	SLL	1.12	1.54	1.29	1.00	1.43	1.18	1.43	1.32
26HH	SLH	1.00	1.67	1.02	1.33	1.38	1.52	1.36	1.58
26HH	FRL	1.95	1.59	1.70	1.66	1.21	1.46	1.59	1.62
26HH	FRH	1.74	1.82	1.65	1.50	1.65	1.51	1.88	1.68
26HH	FCL	1.20	1.42	1.84	1.44	1.53	1.34	1.49	1.66
26HH	FCH	2.10	1.39	1.66	1.50	1.37	1.57	1.91	1.64
26HH	FLL	2.19	2.04	1.99	1.47	1.51	1.63	1.45	1.75
26HH	FLH	1.70	2.12	1.71	1.45	1.71	1.95	1.67	1.76
27HH	SRL	1.54	.88	1.59	1.65	1.66	1.60	2.01	1.91
27HH	SRH	1.61	1.38	1.42	1.46	1.67	1.81	1.79	1.74
27HH	SCL	1.38	1.76	1.54	.90	1.33	1.44	2.00	1.48
27HH	SCH	1.38	1.70	1.87	1.04	1.57	1.34	1.38	1.98
27HH	SLL	1.71	1.25	1.85	1.41	1.46	1.60	1.73	1.80
27HH	SLH	1.39	1.27	1.98	1.19	1.11	1.10	1.45	1.36
27HH	FRL	1.61	1.54	1.46	1.37	1.49	1.51	1.43	1.54
27HH	FRH	1.99	1.84	1.85	1.69	1.52	1.92	2.04	1.84
27HH	FCL	1.87	1.76	2.12	1.79	1.54	1.52	1.40	1.71
27HH	FCH	1.86	1.83	1.95	1.58	2.06	1.60	1.71	1.79
27HH	FLL	1.68	1.70	1.72	1.53	1.92	1.64	1.64	1.69
27HH	FLH	1.71	2.13	1.82	1.69	1.72	2.00	1.72	1.83
28HL	SRL	1.42	1.52	2.33	1.49	1.54	1.13	1.35	1.20
28HL	SRH	1.34	1.47	1.28	1.40	1.64	1.40	1.51	1.72
28HL	SCL	1.15	1.91	1.45	1.19	.99	.88	.77	1.17
28HL	SCH	1.78	1.36	1.29	1.09	1.30	.83	1.37	1.00
28HL	SLL	1.00	.81	1.07	1.38	.97	.75	1.32	1.26
28HL	SLH	2.23	1.33	1.70	1.12	1.08	.87	1.15	1.16
28HL	FRL	1.68	1.06	1.39	1.48	1.56	1.56	1.89	1.87
28HL	FRH	1.88	1.78	1.88	2.40	1.33	2.05	1.68	1.36
28HL	FCL	.86	1.47	1.07	1.64	1.08	1.11	.68	.68
28HL	FCH	.89	1.07	1.72	1.27	1.10	.87	1.74	1.51
28HL	FLL	.71	1.62	2.10	1.07	1.33	1.35	1.17	1.34
28HL	FLH	1.80	1.05	1.53	2.16	1.71	1.21	1.33	1.47

RAW SCORES--MOVEMENT TIM" (CONT'D)

SUBJECT ID	CONDITION	1	2	3	4	5	6	7	8
29HL	SRL	.98	1.48	.81	.84	.46	1.17	.53	.44
29HL	SRH	.88	.67	.61	.76	.21	.85	.50	.43
29HL	SCL	1.12	.95	.74	.73	.54	.63	.58	.63
29HL	SCH	1.43	.85	.89	.82	.71	.81	.64	.61
29HL	SLL	1.39	1.15	1.22	.88	1.00	.92	.79	.66
29HL	SLH	1.41	1.15	1.17	.78	1.02	.75	.71	1.16
29HL	FRL	.97	.84	.80	.87	.75	.87	.89	.83
29HL	FRH	.67	.54	1.01	1.28	.35	.71	.42	.40
29HL	FCL	1.02	1.07	1.03	.86	.67	.55	1.03	.65
29HL	FCH	.98	.93	1.00	.89	.87	.84	.85	.82
29HL	FLL	1.26	1.15	1.48	1.16	.96	1.23	1.01	.94
29HL	FLH	1.17	1.08	1.15	1.12	.96	1.06	1.01	1.09
30HL	SRL	1.76	1.99	1.00	1.49	1.30	.83	1.17	.87
30HL	SRH	1.14	.92	1.05	1.56	1.57	1.24	.82	.84
30HL	SCL	1.21	1.02	1.18	1.59	1.11	1.23	1.30	1.03
30HL	SCH	1.59	1.33	1.52	1.43	1.40	.96	.99	1.32
30HL	SLL	1.59	1.65	1.61	1.66	1.61	1.71	1.39	1.70
30HL	SLH	1.69	1.78	2.05	2.05	1.74	1.38	1.21	1.61
30HL	FRL	1.56	1.63	2.04	1.38	1.40	1.45	1.81	1.78
30HL	FRH	1.58	2.21	1.78	1.75	1.49	1.74	1.85	1.61
30HL	FCL	1.75	1.68	1.64	2.17	1.49	1.61	1.60	1.47
30HL	FCH	2.24	2.35	1.78	1.94	1.95	1.90	2.01	1.06
30HL	FLL	1.62	2.12	1.90	1.48	1.71	1.60	1.85	1.40
30HL	FLH	1.98	1.93	2.19	2.18	1.99	1.73	1.82	1.66
31HL	SRL	1.74	1.23	1.26	1.40	1.09	1.26	1.98	1.42
31HL	SRH	1.17	2.06	1.61	1.75	1.21	1.62	1.17	1.96
31HL	SCL	1.36	1.15	1.17	1.63	1.14	1.64	1.33	1.44
31HL	SCH	1.15	1.38	1.47	.71	1.95	1.09	1.65	1.63
31HL	SLL	1.14	1.10	1.25	.66	1.95	1.94	1.98	1.43
31HL	SLH	1.73	1.49	.91	1.52	1.40	1.68	1.39	1.06
31HL	FRL	1.56	1.78	1.43	1.69	1.39	1.63	1.29	1.80
31HL	FRH	1.85	1.67	1.76	1.39	1.90	1.70	1.40	1.95
31HL	FCL	1.41	1.53	1.62	2.02	1.47	1.24	1.35	1.20
31HL	FCH	2.20	1.91	1.56	1.40	1.39	1.10	1.62	1.55
31HL	FLL	2.06	2.22	1.74	1.61	1.35	1.68	1.58	1.21
31HL	FLH	2.11	2.07	2.12	1.91	1.87	1.55	1.67	1.57
32HL	SRL	.96	.94	1.18	.97	1.02	1.20	.92	.98
32HL	SRH	.66	.82	1.06	.85	.91	.95	.92	1.12
32HL	SCL	1.11	1.42	1.10	1.49	.93	.92	.88	.97
32HL	SCH	.89	1.31	1.01	1.07	.96	.93	.97	.92
32HL	SLL	1.85	1.79	1.49	1.67	1.91	1.85	1.90	1.92
32HL	SLH	1.42	1.75	1.40	1.95	1.78	1.88	1.91	1.90
32HL	FRL	.85	1.03	1.40	1.33	1.36	1.59	1.56	1.55
32HL	FRH	1.18	1.38	.91	1.04	.94	.91	1.03	.91
32HL	FCL	1.47	1.14	1.38	1.18	1.21	1.16	1.10	1.03
32HL	FCH	1.43	1.41	1.56	1.53	1.42	1.39	1.38	1.24
32HL	FLL	1.85	1.59	1.44	1.90	1.21	1.15	1.11	1.27
32HL	FLH	1.44	1.69	1.45	1.67	1.32	1.28	1.30	1.43

RAW SCORES--MOVEMENT TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
33HL	SRL	1.35	1.34	1.43	1.40	1.46	1.33	1.59	1.33
33HL	SRH	1.98	1.75	2.07	1.88	1.58	1.97	1.94	1.85
33HL	SCL	2.15	2.03	1.43	1.86	1.63	1.90	1.91	1.98
33HL	SCH	1.53	2.51	1.76	1.97	1.95	1.58	2.07	1.47
33HL	SLL	2.07	2.05	1.95	1.92	1.82	1.85	1.84	1.88
33HL	SLH	2.36	2.26	2.39	2.42	2.59	2.51	2.41	2.39
33HL	FRL	2.26	2.38	1.73	2.21	2.24	2.25	2.50	2.15
33HL	FRH	2.49	2.38	2.83	2.41	2.22	2.17	2.31	2.44
33HL	FCL	1.67	1.77	1.51	2.41	1.45	1.93	1.51	1.77
33HL	FCH	2.26	1.77	2.26	1.78	1.58	1.50	1.45	1.65
33HL	FLL	2.06	1.82	2.07	1.57	1.50	1.43	1.58	1.51
33HL	FLH	2.38	2.24	2.38	2.45	2.45	2.67	2.49	2.54
34HL	SRL	1.02	.98	.92	.86	.80	1.16	.86	1.88
34HL	SRH	.48	.89	1.08	1.08	.95	.99	.87	.81
34HL	SCL	1.26	.97	1.39	.81	1.21	1.32	1.22	1.48
34HL	SCH	1.06	.80	1.44	1.05	1.12	1.09	.92	1.22
34HL	SLL	1.38	1.35	1.35	.45	1.52	1.26	1.41	1.39
34HL	SLH	1.27	1.37	1.01	.76	.95	1.07	1.02	1.13
34HL	FRL	.69	.88	.84	.70	1.11	.84	.88	1.11
34HL	FRH	.53	.98	.85	.95	1.09	1.00	1.89	1.42
34HL	FCL	1.26	1.46	1.26	.97	.92	.72	1.16	1.77
34HL	FCH	1.41	1.43	.83	1.44	1.09	.94	1.43	.97
34HL	FLL	1.35	1.32	1.64	1.32	1.42	1.40	1.24	1.66
34HL	FLH	1.23	1.46	1.18	1.57	1.03	1.39	1.63	.78
35HL	SRL	1.01	1.31	1.03	1.00	.95	.71	1.02	1.21
35HL	SRH	1.08	1.34	.87	1.34	1.12	.71	1.04	1.16
35HL	SCL	.83	1.03	1.07	.91	1.00	.90	1.01	1.23
35HL	SCH	.71	1.72	1.00	.97	.95	.99	.74	.83
35HL	SLL	1.58	1.65	1.34	1.05	1.09	1.31	1.21	1.28
35HL	SLH	1.44	1.39	1.47	1.29	1.21	1.13	1.13	1.26
35HL	FRL	1.15	1.08	1.76	1.42	.80	.63	1.23	1.10
35HL	FRH	1.84	2.00	1.07	1.48	1.34	1.12	1.68	1.63
35HL	FCL	1.69	1.57	1.41	1.68	1.21	1.37	1.18	1.20
35HL	FCH	1.68	1.47	1.62	2.03	1.17	1.12	1.38	1.32
35HL	FLL	1.59	1.44	1.64	1.38	1.12	1.23	1.39	1.26
35HL	FLH	2.16	1.61	1.75	1.63	1.40	1.36	1.44	1.53
36HL	SRL	1.34	1.53	1.16	1.65	.89	.57	.39	.90
36HL	SRH	1.49	1.21	.86	.88	.98	.69	.58	1.07
36HL	SCL	1.00	1.24	1.18	1.19	1.44	.97	1.04	1.36
36HL	SCH	1.31	1.22	1.06	1.37	1.65	1.25	1.67	.97
36HL	SLL	1.41	1.68	1.19	1.78	1.31	1.23	1.40	1.31
36HL	SLH	1.32	1.44	1.21	1.56	1.47	1.24	.98	1.33
36HL	FRL	1.60	.99	1.01	1.08	1.17	.97	.43	.81
36HL	FRH	1.43	1.46	1.80	1.26	1.23	1.29	1.83	1.37
36HL	FCL	1.61	1.44	2.27	1.27	1.05	1.26	1.10	1.50
36HL	FCH	1.45	2.06	1.86	1.61	1.24	1.46	.33	1.57
36HL	FLL	1.75	1.00	2.12	1.17	1.34	1.07	1.03	1.25
36HL	FLH	1.7[illegible]	1.78	1.74	1.58	1.58	1.44	1.45	1.37

RAW SCORES--MOVEMENT TIME (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
37CH	SRL	1.57	1.30	1.11	1.32	1.24	1.36	1.24	1.58
37CH	SRH	1.66	1.64	1.21	1.14	1.20	1.16	1.20	1.11
37CH	SCL	.96	1.46	1.29	1.31	1.21	1.31	1.49	1.46
37CH	SCH	.95	.93	1.31	.98	.98	.97	.75	.97
37CH	SLL	1.35	1.31	1.67	1.40	1.24	1.40	1.40	1.49
37CH	SLH	1.27	1.23	1.39	1.29	1.23	1.30	1.32	1.35
37CH	FRL	1.10	1.54	1.14	1.22	1.10	1.24	1.12	1.38
37CH	FRH	1.49	1.65	1.52	1.58	1.71	1.59	1.66	1.46
37CH	FCL	1.36	1.49	1.45	1.39	1.54	1.40	1.25	1.26
37CH	FCH	1.28	1.63	1.56	1.67	1.69	1.67	1.72	1.54
37CH	FLL	1.32	1.29	1.31	1.36	1.32	1.37	1.36	1.59
37CH	FLH	1.35	1.52	1.39	1.55	1.65	1.54	1.60	1.78
38CH	SRL	1.59	.81	.81	.92	.86	1.01	.76	.72
38CH	SRH	.97	1.24	.97	1.07	1.09	1.10	.90	1.39
38CH	SCL	1.15	1.19	1.11	.96	.74	.93	.77	.67
38CH	SCH	1.06	.63	.94	.88	.94	.91	.75	1.00
38CH	SLL	1.52	1.34	1.56	1.46	1.45	1.49	1.42	1.49
38CH	SLH	1.53	1.42	1.44	1.44	1.30	1.48	1.19	1.77
38CH	FRL	1.25	1.51	1.26	1.38	1.25	1.52	1.57	2.09
38CH	FRH	1.88	1.68	1.45	1.62	1.62	1.65	1.85	1.87
38CH	FCL	1.33	1.35	1.61	1.48	1.80	1.62	1.65	1.58
38CH	FCH	1.57	1.55	1.57	1.62	1.66	1.67	1.70	1.79
38CH	FLL	1.64	1.54	1.36	1.55	1.64	1.50	1.47	1.50
38CH	FLH	1.91	1.80	1.50	1.70	1.66	1.55	2.04	1.77
39CH	SRL	1.40	1.22	1.22	1.29	1.27	1.07	1.15	1.20
39CH	SRH	1.81	1.31	1.28	1.29	1.42	1.50	1.51	1.38
39CH	SCL	1.16	1.21	1.29	1.20	1.25	1.40	1.31	1.20
39CH	SCH	1.36	1.43	1.45	1.38	1.37	1.41	1.35	1.24
39CH	SLL	1.53	1.31	1.33	1.20	1.31	1.32	1.28	1.24
39CH	SLH	1.60	1.50	1.49	1.63	1.52	1.32	1.61	1.67
39CH	FRL	1.16	1.26	1.33	1.23	1.39	1.36	1.31	1.62
39CH	FRH	1.39	1.30	1.16	1.54	1.48	1.25	1.43	1.18
39CH	FCL	1.53	1.47	1.31	1.31	1.42	1.26	1.24	1.17
39CH	FCH	1.44	1.24	1.15	1.28	1.30	1.15	1.18	1.15
39CH	FLL	1.41	1.31	1.38	1.42	1.36	1.25	1.38	1.44
39CH	FLH	1.18	1.38	1.21	1.23	1.27	1.09	1.18	1.27
40CH	SRL	.84	.92	1.00	.89	.97	1.15	1.10	1.01
40CH	SRH	1.25	1.30	.79	1.26	1.27	.84	1.16	1.34
40CH	SCL	.95	1.36	1.18	1.20	1.21	1.31	1.34	1.35
40CH	SCH	.79	1.09	1.18	1.29	1.19	1.39	1.23	1.13
40CH	SLL	1.48	1.33	1.36	1.46	1.40	1.56	1.51	1.47
40CH	SLH	.98	1.42	1.39	1.22	1.25	1.27	1.31	1.33
40CH	FRL	1.43	1.48	1.19	1.36	1.37	1.55	1.58	1.62
40CH	FRH	1.56	1.61	1.38	1.54	1.60	1.42	1.45	1.67
40CH	FCL	1.37	1.43	1.28	1.59	1.44	1.61	1.58	1.53
40CH	FCH	1.51	1.61	1.82	1.46	1.52	1.58	1.70	1.91
40CH	FLL	1.36	1.63	1.79	1.52	1.53	1.61	1.67	1.77
40CH	FLH	1.53	1.34	1.60	1.92	1.81	1.76	1.63	1.49

RAW SCORES--MOVEMENT TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
41CH	SRL	1.51	1.59	1.47	1.52	1.21	1.46	1.20	1.43
41CH	SRH	1.28	1.33	1.61	1.40	1.24	1.50	1.72	1.63
41CH	SCL	1.78	1.25	1.39	1.40	1.45	1.39	1.38	1.37
41CH	SCH	1.33	1.22	1.45	1.45	1.46	1.49	1.52	1.41
41CH	SLL	1.69	1.38	1.59	1.61	1.65	1.61	1.56	1.77
41CH	SLH	1.52	1.78	1.81	1.80	1.74	1.72	1.71	1.69
41CH	FRL	1.39	1.76	1.41	1.35	1.28	1.28	1.28	1.25
41CH	FRH	1.46	1.56	1.38	1.41	1.57	1.52	1.50	1.45
41CH	FCL	1.85	1.29	1.46	1.38	1.30	1.27	1.23	1.47
41CH	FCH	1.75	1.62	1.47	1.53	1.59	1.41	1.38	1.30
41CH	FLL	1.88	1.57	1.34	1.51	1.57	1.51	1.45	1.28
41CH	FLH	1.81	1.44	1.45	1.36	1.28	1.31	1.31	1.23
42CH	SRL	1.12	1.27	1.23	1.25	1.26	1.16	1.10	1.21
42CH	SRH	1.19	1.29	1.26	1.28	1.30	1.32	1.32	1.30
42CH	SCL	1.87	1.52	1.51	1.56	1.64	1.55	1.49	1.61
42CH	SCH	1.75	1.70	1.41	1.51	1.56	1.53	1.48	1.40
42CH	SLL	2.09	1.65	1.67	1.60	1.48	1.42	1.37	1.40
42CH	SLH	1.87	1.72	1.73	1.80	1.43	1.39	1.33	1.39
42CH	FRL	1.24	1.51	1.28	1.29	1.29	1.25	1.22	1.23
42CH	FRH	1.23	1.39	1.54	1.46	1.25	1.26	1.28	1.29
42CH	FCL	1.39	1.45	1.69	1.51	1.48	1.33	1.22	1.40
42CH	FCH	.79	.77	1.05	1.05	1.07	1.00	.94	1.00
42CH	FLL	1.50	1.46	1.61	1.43	1.27	1.30	1.25	1.39
42CH	FLH	1.44	1.54	1.40	1.40	1.42	1.26	1.16	1.39
43CH	SRL	1.30	1.25	1.21	1.19	1.34	1.31	1.10	1.03
43CH	SRH	1.29	1.33	1.47	1.31	2.01	1.55	1.56	1.53
43CH	SCL	1.33	1.21	1.11	.96	1.13	1.29	1.20	1.15
43CH	SCH	1.71	1.42	1.39	1.32	1.56	1.45	1.32	1.19
43CH	SLL	.91	.89	.88	1.01	.93	1.32	1.01	.77
43CH	SLH	1.18	1.27	1.39	1.44	1.85	1.31	1.42	1.59
43CH	FRL	1.55	1.23	1.15	1.32	1.52	1.12	1.26	1.37
43CH	FRH	1.20	1.26	1.37	1.41	1.42	1.20	1.25	1.31
43CH	FCL	1.19	1.00	.92	.76	1.66	1.54	1.39	1.35
43CH	FCH	1.03	1.00	1.03	.89	1.05	1.27	1.12	1.10
43CH	FLL	1.25	1.26	1.02	1.28	1.32	1.37	1.35	1.30
43CH	FLH	1.36	1.32	1.30	1.17	1.18	1.20	1.50	1.61
44CH	SRL	1.30	1.29	1.45	1.50	1.69	1.16	1.06	1.29
44CH	SRH	1.40	1.30	1.76	1.59	1.52	1.60	1.55	1.48
44CH	SCL	1.21	1.13	1.39	1.24	1.06	1.39	1.25	1.19
44CH	SCH	1.70	1.68	1.06	1.15	1.39	1.53	1.66	1.24
44CH	SLL	1.45	1.48	1.23	1.26	1.30	1.27	1.45	1.17
44CH	SLH	1.40	1.35	1.57	1.46	1.44	1.48	1.38	1.04
44CH	FRL	1.37	1.37	1.39	1.35	1.31	1.02	1.03	1.25
44CH	FRH	1.45	1.46	1.43	1.30	1.29	1.12	1.13	1.08
44CH	FCL	1.23	1.25	1.21	1.25	1.27	1.08	1.07	1.25
44CH	FCH	1.60	1.66	1.16	1.24	1.12	1.43	1.43	1.36
44CH	FLL	1.21	1.25	1.23	1.41	1.41	1.16	1.42	1.15
44CH	FLH	1.65	1.63	1.50	1.40	1.30	1.24	1.28	1.25

RAW SCORES--MOVEMENT TIME (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
45CH	SRL	1.45	1.50	1.82	1.61	1.47	1.58	1.38	1.42
45CH	SRH	1.59	1.69	1.40	1.40	1.40	1.40	1.57	1.34
45CH	SCL	1.35	1.57	1.54	1.46	1.50	1.45	1.41	1.15
45CH	SCH	1.67	1.66	1.59	1.67	1.71	1.99	1.42	1.94
45CH	SLL	1.20	.95	.94	.95	1.00	.95	1.15	1.10
45CH	SLH	1.78	1.47	1.45	1.44	1.42	1.41	1.35	1.20
45CH	FRL	1.96	1.78	1.90	1.63	1.74	1.52	1.62	1.41
45CH	FRH	1.96	2.05	1.79	1.71	1.67	1.60	1.52	1.45
45CH	FCL	1.36	1.89	1.69	1.56	1.50	1.44	1.48	1.65
45CH	FCH	1.77	1.60	1.45	1.50	1.53	1.52	1.44	1.40
45CH	FLL	1.88	1.81	1.89	1.85	1.76	1.70	1.86	1.58
45CH	FLH	1.72	1.55	1.88	1.81	1.85	1.80	1.34	1.53
46CL	SRL	1.14	1.23	.97	1.18	1.26	1.38	1.40	1.20
46CL	SRH	.79	1.06	.89	.91	1.00	1.04	1.08	1.08
46CL	SCL	.54	.55	.87	.96	1.01	1.07	.87	1.18
46CL	SCH	1.33	1.19	1.43	1.39	1.36	1.32	.93	1.55
46CL	SLL	1.08	.82	.92	.97	1.05	1.07	1.10	1.18
46CL	SLH	1.69	1.47	1.34	1.51	1.66	1.76	1.66	1.59
46CL	FRL	1.58	1.75	1.49	1.50	1.62	1.88	1.56	1.57
46CL	FRH	1.31	1.83	1.63	1.80	1.77	1.86	1.79	1.90
46CL	FCL	.83	1.16	1.37	1.34	1.23	1.20	1.62	1.51
46CL	FCH	1.79	1.33	1.53	1.72	1.80	1.82	1.70	1.83
46CL	FLL	1.58	1.42	1.35	1.40	1.44	1.55	1.68	1.87
46CL	FLH	1.56	1.66	1.76	1.70	1.65	1.62	2.00	1.84
47CL	SRL	1.80	1.39	1.31	1.45	1.87	1.39	1.43	1.52
47CL	SRH	1.45	1.46	1.42	1.61	1.93	1.43	1.47	1.50
47CL	SCL	.48	1.31	1.23	1.10	.49	1.49	1.20	1.04
47CL	SCH	.51	1.12	1.05	1.00	.97	1.29	1.29	1.29
47CL	SLL	1.86	1.56	1.36	1.30	1.19	1.05	1.00	.90
47CL	SLH	1.65	1.55	1.59	1.51	.95	1.62	1.40	1.31
47CL	FRL	1.02	1.60	1.74	1.52	.97	1.93	1.87	1.93
47CL	FRH	1.87	2.09	1.78	1.87	1.88	2.36	2.34	2.29
47CL	FCL	1.94	1.83	2.32	2.00	1.93	1.93	2.00	2.01
49CL	FCH	1.65	2.17	2.27	2.00	1.90	2.13	2.10	2.11
47CL	FLL	1.63	1.53	1.78	1.75	1.75	1.65	1.80	1.95
47CL	FLH	1.96	2.46	1.97	1.95	1.18	2.04	2.06	2.14
48CL	SRL	1.02	1.09	1.07	1.07	1.05	1.05	1.04	1.07
48CL	SRH	1.31	.95	1.00	1.20	1.28	1.13	1.03	1.33
48CL	SCL	1.26	.88	.75	.67	1.00	1.00	1.03	.82
48CL	SCH	.74	.68	.68	.68	.77	.77	.60	.91
48CL	SLL	.90	1.33	1.27	1.30	1.00	1.10	1.07	1.06
48CL	SLH	1.18	1.10	1.26	1.42	1.21	1.20	1.22	.56
48CL	FRL	1.08	1.12	1.23	1.26	1.19	1.23	1.25	1.40
48CL	FRH	1.35	1.25	1.25	1.21	1.29	1.30	1.34	1.44
48CL	FCL	1.32	1.03	1.16	1.33	1.30	1.27	1.05	1.06
48CL	FCH	1.59	1.35	1.29	1.25	1.41	1.26	1.11	1.12
48CL	FLL	1.34	1.27	1.25	1.23	1.30	1.25	1.23	1.26
48CL	FLH	1.45	1.28	1.31	1.39	1.15	1.33	1.41	1.78

RAW SCORES--MOVEMENT TIME (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
49CL	SRL	2.02	1.61	1.74	1.74	1.75	1.74	1.78	1.76
49CL	SRH	1.20	1.17	1.38	1.36	1.36	1.32	1.37	1.27
49CL	SCL	1.66	1.97	1.53	2.22	1.79	1.81	1.80	1.87
49CL	SCH	.90	1.10	1.38	1.22	1.33	1.47	1.31	1.46
49CL	SLL	1.76	1.83	1.99	2.02	2.09	2.06	2.01	2.05
49CL	SLH	1.45	2.10	2.15	2.02	2.04	2.39	2.16	2.08
49CL	FRL	1.26	1.79	1.36	1.71	1.96	1.27	1.21	1.23
49CL	FRH	1.01	1.15	1.52	1.34	1.49	1.41	1.40	1.43
49CL	FCL	1.34	1.28	1.53	1.60	1.17	1.23	1.20	1.36
49CL	FCH	.91	1.12	1.43	1.02	.90	1.58	1.43	1.37
49CL	FLL	1.33	1.60	1.64	1.91	1.82	1.92	1.80	1.86
49CL	FLH	1.30	1.60	1.54	1.52	1.67	1.83	1.73	1.77
50CL	SRL	.91	.96	1.17	1.16	1.38	1.17	1.15	1.16
50CL	SRH	1.03	1.70	1.49	1.53	1.23	1.39	1.43	1.40
50CL	SCL	1.17	1.32	1.71	1.17	1.27	1.25	1.27	1.25
50CL	SCH	.63	1.13	1.22	1.24	1.22	1.29	1.25	1.25
50CL	SLL	1.27	1.53	1.47	1.40	1.63	1.48	1.50	1.46
50CL	SLH	1.30	1.55	1.44	1.69	1.55	1.68	1.65	1.65
50CL	FRL	1.17	1.23	1.51	1.60	1.50	1.59	1.60	1.60
50CL	FRH	1.38	1.46	1.55	1.54	2.10	1.54	1.57	1.53
50CL	FCL	1.91	1.67	2.08	2.08	1.98	2.07	2.10	2.09
50CL	FCH	1.64	1.63	1.69	1.68	1.89	1.75	1.73	1.76
50CL	FLL	1.28	1.56	1.69	1.29	1.74	2.01	1.83	1.76
50CL	FLH	1.10	1.55	1.58	1.84	1.84	1.71	1.67	1.77
51CL	SRL	.94	.77	1.28	1.06	1.53	1.33	1.35	1.26
51CL	SRH	1.02	.85	.85	.76	.75	.76	.80	.80
51CL	SCL	.91	.94	1.26	1.31	1.21	1.14	1.15	1.17
51CL	SCH	1.46	1.16	1.01	1.05	1.15	1.16	1.18	1.15
51CL	SLL	1.43	1.51	1.71	1.71	1.48	1.84	1.76	1.73
51CL	SLH	1.48	1.41	1.31	1.87	1.58	1.40	1.53	1.53
51CL	FRL	.77	.87	1.65	1.79	1.32	1.59	1.66	1.72
51CL	FRH	1.16	1.25	.99	1.78	1.68	1.69	1.73	1.66
51CL	FCL	1.12	1.60	1.60	1.80	2.05	1.43	1.61	1.65
51CL	FCH	1.21	1.57	1.76	1.65	2.07	1.88	1.78	1.89
51CL	FLL	1.64	1.48	1.95	1.57	1.50	2.13	1.76	2.00
51CL	FLH	1.34	1.31	1.83	2.02	2.17	1.93	2.00	1.98
52CL	SRL	1.19	1.06	.77	.98	.90	.88	.90	.91
52CL	SRH	1.00	.69	1.20	.78	.83	.89	.90	.87
52CL	SCL	1.00	1.21	.91	1.12	1.07	1.06	1.00	1.09
52CL	SCH	1.27	.87	1.23	.97	.97	.99	.98	1.00
52CL	SLL	1.21	1.32	1.24	1.35	1.41	1.11	1.31	1.30
52CL	SLH	1.55	1.29	1.36	1.29	1.29	.75	1.28	1.32
52CL	FRL	1.23	.72	.81	.74	.74	.82	.82	.83
52CL	FRH	.85	.84	.79	.87	.81	.79	.82	.79
52CL	FCL	1.06	1.14	1.15	1.12	1.32	.70	1.06	.99
52CL	FCH	1.41	1.15	1.35	1.17	1.01	1.09	1.13	1.10
52CL	FLL	1.35	1.00	1.34	1.32	1.23	1.21	1.20	1.24
52CL	FLH	1.21	1.35	1.11	1.23	1.20	1.27	1.25	1.21

RAW SCORES--MOVEMENT TIME (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
53CL	SRL	.91	1.27	1.36	1.47	1.15	1.19	1.20	1.14
53CL	SRH	1.09	.92	1.00	1.08	1.20	1.16	1.05	1.06
53CL	SCL	.75	.80	.80	.78	1.10	.91	.74	.71
53CL	SCH	.47	.62	.63	.70	.74	.61	.52	.46
53CL	SLL	.32	.64	.89	1.13	.91	1.00	1.14	1.18
53CL	SLH	.60	.86	1.01	1.07	1.25	1.13	.88	1.17
53CL	FRL	1.02	1.20	1.16	1.20	1.11	1.32	1.45	1.55
53CL	FRH	1.19	1.11	1.28	1.31	1.18	1.28	1.29	1.38
53CL	FCL	1.05	.92	.79	.68	1.08	1.04	1.08	1.04
53CL	FCH	.92	.99	1.06	1.19	1.31	1.24	1.26	1.27
53CL	FLL	.79	.90	1.00	1.08	1.16	1.18	1.25	1.38
53CL	FLH	.84	1.23	1.25	1.21	1.37	1.31	1.27	1.60
54CL	SRL	1.64	1.87	1.62	1.49	1.82	1.76	1.75	2.07
54CL	SRH	1.49	1.48	1.39	1.32	.81	1.38	1.08	1.48
54CL	SCL	.96	1.37	1.40	1.46	1.45	1.53	1.63	1.52
54CL	SCH	.94	1.49	1.06	.96	.80	1.16	1.37	1.29
54CL	SLL	1.40	1.65	1.60	1.58	1.85	1.86	1.87	1.93
54CL	SLH	1.42	1.52	1.60	1.62	1.54	1.59	1.68	1.62
54CL	FRL	.92	1.44	1.36	1.25	1.45	1.52	1.64	2.01
54CL	FRH	.80	1.95	1.81	1.74	2.12	1.90	1.91	1.90
54CL	FCL	1.15	1.75	1.16	1.53	1.53	1.17	1.15	1.34
54CL	FCH	1.15	1.62	1.27	1.16	1.26	1.25	1.28	1.63
54CL	FLL	1.57	1.66	1.66	1.69	1.26	1.63	1.99	1.85
54CL	FLH	1.66	1.72	1.60	1.45	1.76	1.67	2.08	1.72

DEVIATION SCORES--DISTANCE

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
01JH	SRL	22L	0	8S	21S	1L	12S	5S	10S
01JH	SRH	6L	13L	12L	0	8S	16S	9S	9S
01JH	SCL	12L	0	0	1S	17S	4S	32S	8S
01JH	SCH	0	9L	8L	61L	0	2S	4L	10S
01JH	SLL	18S	0	3S	0	3S	0	2S	3S
01JH	SLH	20L	31L	1L	0	0	0	0	0
01JH	FRL	0	0	0	12S	6S	37S	43S	14S
01JH	FRH	18L	77L	61L	0	0	13L	0	18S
01JH	FCL	0	0	40L	0	16S	32S	6S	12S
01JH	FCH	63L	46L	58L	7L	0	10L	2L	12S
01JH	FLL	12L	11L	0	7S	24S	6S	4S	9S
01JH	FLH	30L	41L	41L	29S	8S	0	0	21S
02JH	SRL	0	4L	19L	17L	33L	28L	12L	16S
02JH	SRH	21L	35L	30L	61L	51L	46L	58L	43L
02JH	SCL	5L	17L	10L	27L	8L	20L	15L	15L
02JH	SCH	0	52L	51L	36L	40L	51L	74L	40L
02JH	SLL	2L	55L	35L	22L	45L	40L	53L	35L
02JH	SLH	14L	15L	5L	8L	5L	5L	5L	8L
02JH	FRL	61S	71S	69S	108S	110S	126S	67S	71S
02JH	FRH	58S	0	28S	0	66S	62S	30S	30S
02JH	FCL	43S	42S	62S	107S	79S	96S	54S	62S
02JH	FCH	0	14L	0	14S	12S	10S	0	7S
02JH	FLL	46S	44S	68S	103S	74S	73S	69S	68S
02JH	FLH	15S	10S	0	4S	3S	14S	5S	7S
03JH	SRL	23L	0	7L	10L	0	23L	0	16L
03JH	SRH	59L	34L	79L	58L	103L	0	20L	108L
03JH	SCL	0	0	0	0	0	1S	0	7L
03JH	SCH	47L	77L	30L	31L	2S	14L	0	19L
03JH	SLL	6L	13L	0	6L	14L	0	0	15L
03JH	SLH	28L	111L	126L	54L	57L	7L	21L	29L
03JH	FRL	99S	59S	0	62S	52S	111S	49S	65S
03JH	FRH	0	0	5L	6L	14L	4L	19L	5L
03JH	FCL	67S	8S	0	29S	52S	73S	0	5L
03JH	FCH	16L	7L	78L	18L	7S	0	18L	0
03JH	FLL	0	0	12L	0	5S	0	28S	5S
03JH	FLH	7L	54L	80L	32L	30L	19L	6L	32L
04JH	SRL	41L	40L	14L	17L	3L	13L	0	8L
04JH	SRH	75L	87L	87L	69L	57L	56L	44L	77L
04JH	SCL	38L	1L	14L	8L	0	0	0	4S
04JH	SCH	66L	82L	89L	73L	54L	55L	92L	43L
04JH	SLL	60L	5L	22L	0	0	23L	0	0
04JH	SLH	69L	80L	84L	76L	73S	84L	103L	48L
04JH	FRL	41S	23S	2S	33S	92S	63S	8S	0
04JH	FRH	19S	0	11L	8L	0	12L	16L	0
04JH	FCL	10S	40S	12S	16L	43S	21S	0	0
04JH	FCH	0	19L	5L	13L	22L	19L	17S	12S
04JH	FLL	26S	59S	8S	22L	7S	17S	35S	0
04JH	FLH	14S	0	0	5L	0	12L	2L	6L

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
05JH	SRL	19L	0	3L	0	0	0	0	0
05JH	SRH	24L	79L	42L	0	45L	55L	10L	36L
05JH	SCL	0	0	0	3S	18S	0	0	0
05JH	SCH	32L	31L	64L	0	4L	109L	19L	27L
05JH	SLL	5L	14L	3L	13L	28L	15S	0	11L
05JH	SLH	32L	9L	44L	28L	63L	14L	39L	32L
05JH	FRL	0	5S	35S	30S	10L	14L	12L	14L
05JH	FRH	15L	27L	0	14S	19S	0	0	11L
05JH	FCL	5L	7L	5S	60S	76S	16S	99S	6L
05JH	FCH	28L	28L	6L	26S	0	0	0	12S
05JH	FLL	20S	9S	42S	10L	25S	43S	9S	22S
05JH	FLH	0	0	1L	6S	4S	0	0	0
06JH	SRL	16L	24S	0	0	0	6S	0	0
06JH	SRH	14S	7S	0	5S	5S	0	23L	7L
06JH	SCL	27S	0	21S	6L	7L	17L	31L	16L
06JH	SCH	8L	1L	35L	31L	64L	59L	73L	38L
06JH	SLL	11S	0	0	20S	0	0	0	0
06JH	SLH	40S	0	12S	7S	0	0	4S	9S
06JH	FRL	27L	13L	13L	39S	0	8S	4S	15S
06JH	FRH	86L	46L	50L	27L	29L	31L	39L	34L
06JH	FCL	11L	46L	8L	0	0	0	0	0
06JH	FCH	61L	97L	63L	53L	76L	46L	43L	63L
06JH	FLL	10L	29L	0	18L	0	0	0	8L
06JH	FLH	41L	28L	65L	0	66L	58L	62L	52L
07JH	SRL	4L	4L	5L	0	0	0	13S	17S
07JH	SRH	49L	13L	16L	38L	4L	0	3S	5S
07JH	SCL	61L	75L	27L	12L	27L	19S	5S	6S
07JH	SCH	4L	0	4L	5L	6L	9L	2L	0
07JH	SLL	12L	19L	13L	14L	10S	16S	12S	13S
07JH	SLH	43L	9L	23L	44L	29L	0	38L	2L
07JH	FRL	42S	43S	45L	41S	33S	53S	41S	62S
07JH	FRH	27L	0	7L	0	4S	0	8L	10L
07JH	FCL	26S	18S	8L	0	0	6S	0	6S
07JH	FCH	4L	2S	0	0	0	0	4L	0
07JH	FLL	27S	17S	13S	10S	19S	7S	0	10S
07JH	FLH	5L	19L	0	0	0	0	0	0
08JH	SRL	14L	0	5L	0	3L	6L	0	10L
08JH	SRH	18L	33L	20L	7L	34L	36L	9L	18L
08JH	SCL	57L	59L	30L	0	0	0	39L	46L
08JH	SCH	69L	89L	65L	88L	7L	55L	62L	83L
08JH	SLL	11L	6L	10L	23L	0	0	14L	19L
08JH	SLH	87L	17L	19L	47L	73L	22L	12L	16L
08JH	FRL	100S	111S	107S	52S	144S	109S	122S	110S
08JH	FRH	81S	78S	54S	91S	89S	54S	38S	35S
08JH	FCL	95S	56S	92S	80S	119S	118S	82S	97S
08JH	FCH	74S	50S	50S	31S	34S	50S	69S	94S
08JH	FLL	86S	100S	103S	73S	129S	92S	125S	116S
08JH	FLH	61S	70S	70S	42S	108S	113S	68S	31S

DEVIATION SCORES--DISTANCE (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
09JH	SRL	48L	22L	33L	16L	12L	24L	24L	23L
09JH	SRH	76L	59L	111L	68L	75L	75L	70L	65L
09JH	SCL	2S	23L	8L	10L	8L	11L	3L	23L
09JH	SCH	64L	98L	102L	87L	106L	85L	65L	76L
09JH	SLL	16L	52L	27L	57L	34L	37L	10L	63L
09JH	SLH	91L	89L	83L	99L	67L	79L	90L	38L
09JH	FRL	4S	44S	62S	47S	33S	41L	25S	76S
09JH	FRH	0	4L	1L	0	23S	8L	0	27S
09JH	FCL	9S	0	10L	9S	5S	6S	5S	4S
09JH	FCH	7L	3L	7L	1S	3L	4L	8L	0
09JH	FLL	51S	7L	0	0	16S	16S	16S	34S
09JH	FLH	0	50L	20L	25S	18S	18S	2L	0
10JL	SRL	4L	0	0	14S	20L	14S	56S	54S
10JL	SRH	42L	11L	0	34L	10L	26L	8S	4S
10JL	SCL	30L	0	0	0	0	0	10S	0
10JL	SCH	41L	16L	38L	154L	37L	91L	3L	37L
10JL	SLL	6S	0	0	42S	26S	23S	61L	61S
10JL	SLH	22L	0	31L	128L	31L	6L	0	44L
10JL	FRL	104S	68S	24S	38S	63S	25S	146S	40S
10JL	FRH	0	0	0	0	0	0	0	36S
10JL	FCL	17S	5S	21S	0	24S	78S	39S	11S
10JL	FCH	1L	0	15L	0	0	0	2L	0
10JL	FLL	45S	58S	10S	0	45S	37S	116S	98S
10JL	FLH	9S	40S	8S	0	0	10L	0	3L
11JL	SRL	75L	45L	23L	0	125L	36L	48L	12S
11JL	SRH	8L	33L	33L	153L	20S	41S	153L	57L
11JL	SCL	0	13L	17L	0	0	117L	117L	13S
11JL	SCH	12L	13L	14L	7L	135L	0	0	146L
11JL	SLL	6L	0	0	0	3L	0	31S	35S
11JL	SLH	0	0	0	10L	0	2L	146L	53L
11JL	FRL	154S	128S	118S	130S	156S	93S	50S	177S
11JL	FRH	153S	121S	120S	12S	164S	157S	176S	32S
11JL	FCL	37S	38S	37S	168S	204S	170S	51S	14S
11JL	FCH	0	62S	160S	155L	16S	166S	1S	0
11JL	FLL	174S	184S	184S	182S	192S	176S	184S	223S
11JL	FLH	169S	94S	144S	155S	172S	51S	36S	160S
12JL	SRL	36L	41L	54L	24L	28L	70L	37L	36L
12JL	SRH	91L	82L	136L	124L	16L	38L	20L	38L
12JL	SCL	64L	161L	102L	36L	2L	0	0	61L
12JL	SCH	8L	31L	147L	56L	23L	28L	25L	65L
12JL	SLL	56L	45L	47L	40L	40L	30L	7L	49L
12JL	SLH	69L	80L	139L	154L	90L	82L	100L	87L
12JL	FRL	69S	12S	4S	34S	34S	37S	82S	56L
12JL	FRH	10S	0	0	7S	19S	26S	6S	12S
12JL	FCL	10S	7S	0	81S	59S	150S	17S	9S
12JL	FCH	26S	0	0	0	2S	0	41S	0
12JL	FLL	67S	66S	20S	65S	86S	70S	64S	80S
12JL	FLH	0	44S	17L	12S	81S	32S	43S	46S

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
13JL	SRL	26L	58L	0	10L	41S	26S	26S	12S
13JL	SRH	28L	35L	38L	78L	0	2L	0	2S
13JL	SCL	0	0	9L	0	0	0	0	45S
13JL	SCH	29L	21L	31L	58L	8L	31L	119L	24L
13JL	SLL	16L	28L	5L	0	0	29S	1S	14S
13JL	SLH	69L	51L	134L	36L	39L	12L	112L	10L
13JL	FRL	120S	154S	48S	119S	26S	162S	45S	72S
13JL	FRH	35S	124S	35S	0	3S	18S	13S	0
13JL	FCL	49S	53S	0	0	94S	62S	24S	26S
13JL	FCH	11S	2L	0	3S	20L	18L	27L	0
13JL	FLL	72S	65S	59S	22S	119S	5S	34S	16S
13JL	FLH	39S	16S	92S	25S	0	48S	15S	0
14JL	SRL	68L	25L	34L	0	12L	20L	7S	0
14JL	SRH	119L	67L	28L	17L	2L	39L	0	32L
14JL	SCL	83L	31L	47L	0	0	62L	2L	8L
14JL	SCH	155L	76L	55L	0	26L	102L	192L	132L
14JL	SLL	57L	10L	5L	0	12S	11L	0	7L
14JL	SLH	126L	46L	31L	63L	211L	32L	12L	10L
14JL	FRL	68S	125S	123S	61S	53S	98S	45S	66S
14JL	FRH	25S	107S	29S	128S	45S	37S	23S	10S
14JL	FCL	60S	61S	144S	37S	28S	54S	38S	39S
14JL	FCH	11S	83S	0	95S	22S	21S	7S	3S
14JL	FLL	46S	52S	62S	96S	73S	49S	54S	22S
14JL	FLH	15S	4S	0	110S	107S	42S	48S	0
15JL	SRL	5L	0	34L	0	0	19L	27L	27L
15JL	SRH	41L	46L	54L	73L	67L	56L	110L	80L
15JL	SCL	18L	92L	6L	98L	0	9L	9L	6S
15JL	SCH	155L	160L	175L	126L	185L	121L	55L	69L
15JL	SLL	23L	7L	43L	101L	14L	36L	9L	19L
15JL	SLH	88L	113L	138L	108L	119L	115L	95L	102L
15JL	FRL	0	133S	40S	29S	76S	67S	85S	37S
15JL	FRH	9S	21S	44L	0	3L	10S	0	0
15JL	FCL	0	19S	23L	10S	34S	19S	0	12S
15JL	FCH	19L	0	20L	6L	0	15L	14L	0
15JL	FLL	4L	0	0	0	9S	10L	37S	28S
15JL	FLH	8L	2S	10L	3L	0	7L	8L	0
16JL	SRL	143S	30L	38L	27L	0	0	34S	37L
16JL	SRH	35L	17L	47L	52L	59L	26L	13S	29L
16JL	SCL	0	0	0	9L	27L	0	10S	7L
16JL	SCH	48L	33L	26L	19L	13S	25S	0	30L
16JL	SLL	0	47L	49L	0	0	13S	3S	45L
16JL	SLH	9L	3L	64L	5L	0	2L	15L	9L
16JL	FRL	120S	57S	70S	37S	143S	144S	59S	126S
16JL	FRH	0	6S	0	28S	26S	115S	60S	43S
16JL	FCL	22S	39S	62S	166S	41S	0	27L	39S
17JL	FCH	26S	27S	9S	154S	174S	153S	115L	120S
16JL	FLL	22S	42S	16S	19S	66S	209S	101S	124S
16JL	FLH	0	10S	1L	22S	0	2S	11S	9S

DEVIATION SCORES--DISTANCE (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
17JL	SRL	25L	4L	106L	68L	47L	37L	0	0
17JL	SRH	79L	44L	90L	71L	140L	47L	146L	77L
17JL	SCL	65L	41L	18L	36L	24L	107L	11L	180S
17JL	SCH	87L	18L	62L	80L	131L	168L	56L	38L
17JL	SLL	42L	0	0	78L	74L	0	11L	42L
17JL	SLH	98L	42L	65L	155L	150L	80L	44L	44L
17JL	FRL	5S	167S	0	0	0	22S	7S	0
17JL	FRH	10S	28S	21L	7L	22L	24L	23L	20L
17JL	FCL	15S	48S	0	2L	0	1S	24S	0
17JL	FCH	20S	33S	12L	41L	18L	26L	9L	15L
17JL	FLL	0	0	0	0	0	10S	12S	24S
17JL	FLH	75S	81S	0	15L	30L	0	71L	30L
18JL	SRL	8S	0	0	0	0	13L	19L	2L
18JL	SRH	3L	19L	0	0	25L	14L	36L	31L
18JL	SCL	0	0	0	0	0	0	2L	0
18JL	SCH	16L	21L	11L	15L	0	5L	105L	26L
18JL	SLL	3L	22L	14L	57L	65L	0	0	22L
18JL	SLH	68L	40L	27L	42L	49L	44L	39L	27L
18JL	FRL	44S	75S	22S	0	70S	126S	72S	90S
18JL	FRH	48L	50L	33L	65L	119S	12S	0	0
18JL	FCL	88S	76S	29L	15L	171S	53S	31S	170S
18JL	FCH	102L	65L	55L	9L	20S	17S	5L	35S
18JL	FLL	100S	95L	0	50S	57S	29S	81S	111S
18JL	FLH	19L	61L	45L	66L	25S	0	47S	0
19HH	SRL	61L	53L	48L	57L	0	9L	34L	9L
19HH	SRH	146L	68L	94L	10L	33L	69L	64L	30L
19HH	SCL	88L	55L	0	0	0	0	20L	0
19HH	SCH	165L	149L	67L	24L	17L	0	62L	12L
19HH	SLL	17L	41L	39L	23L	15L	14L	23L	11L
19HH	SLH	143L	72L	39L	70L	57L	15L	64L	51L
19HH	FRL	66L	46L	29L	44S	18S	12S	36S	40S
19HH	FRH	75L	22L	54L	0	0	1L	22L	0
19HH	FCL	70L	0	41L	28S	84S	16S	43S	64S
19HH	FCH	66L	62L	0	0	3L	4L	21L	12L
19HH	FLL	21L	31L	3L	25S	16S	0	16S	15S
19HH	FLH	62L	35L	38L	32L	30L	24L	39L	54L
20HH	SRL	52L	57L	39L	0	0	12S	0	19L
20HH	SRH	72L	58L	54L	0	1L	0	4L	26L
20HH	SCL	36L	33L	28L	0	0	0	2S	52L
20HH	SCH	110L	66L	89L	36L	35L	26L	0	41L
20HH	SLL	57L	63L	88L	41L	20L	18L	0	55L
20HH	SLH	105L	111L	77L	66L	9L	18L	0	26S
20HH	FRL	11S	5S	0	44S	38S	33S	27S	23S
20HH	FRH	3L	0	17L	22S	13S	7S	0	3S
20HH	FCL	0	2S	0	6S	22S	20S	14S	9S
20HH	FCH	19L	36L	0	0	0	0	0	7L
20HH	FLL	37S	5S	0	42S	42S	46S	12S	26S
20HH	FLH	20L	0	10L	34S	0	1L	0	0

DEVIATION SCORES--DISTANCE (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
21HH	SRL	27L	39L	66L	59L	0	0	27S	0
21HH	SRH	40L	50L	76L	3L	34L	38L	12L	50L
21HH	SCL	13L	49L	8L	24L	0	0	9S	0
21HH	SCH	53L	36L	41L	14L	0	21L	1S	0
21HH	SLL	44L	25L	33L	31L	19L	0	2L	0
21HH	SLH	73L	40L	103L	73L	0	3L	25L	0
21HH	FRL	0	29S	27S	19S	69S	77S	8S	0
21HH	FRH	133L	52L	36L	0	0	17L	40L	40L
21HH	FCL	0	0	36L	12L	0	17L	0	9L
21HH	FCH	92L	66L	81L	26L	31L	82L	65L	76L
21HH	FLL	14L	23L	33L	41L	37S	23S	4L	12L
21HH	FLH	32L	21L	27L	60L	50L	4L	64L	0
22HH	SRL	13L	26L	24L	0	9L	0	0	0
22HH	SRH	16L	27L	34L	49L	131L	44L	69L	25L
22HH	SCL	39L	17L	0	63L	11L	0	0	3L
22HH	SCH	0	13L	22L	18L	16L	54L	15L	20L
22HH	SLL	8L	13L	24L	17L	13L	20L	0	8L
22HH	SLH	12L	48L	40L	38L	81L	28L	42L	21L
22HH	FRL	0	80S	0	12L	0	1L	0	0
22HH	FRH	0	5S	36L	0	30L	31L	33L	19L
22HH	FCL	0	34S	7S	0	16L	9L	5L	0
22HH	FCH	61L	61L	45L	0	19L	52L	36L	11L
22HH	FLL	0	21L	25L	15S	9L	0	0	3L
22HH	FLH	28L	30L	0	48L	33L	44L	18L	23L
23HH	SRL	30L	3S	14L	4L	9S	32S	0	19L
23HH	SRH	22L	24L	20L	2L	12L	33L	16L	25L
23HH	SCL	2L	0	8L	0	9S	31S	15L	0
23HH	SCH	6L	4S	13L	29L	0	9L	10L	23L
23HH	SLL	12L	26L	12L	4L	0	9L	8S	27L
23HH	SLH	7L	14L	29L	23L	23L	80L	0	56L
23HH	FRL	35S	17S	20S	28S	32S	7S	11S	14S
23HH	FRH	53L	54L	23L	30L	0	0	12L	8L
23HH	FCL	0	0	15S	15S	12S	36S	14S	32S
23HH	FCH	36L	28L	13L	2L	0	28L	0	0
23HH	FLL	0	17S	45S	2S	24S	21S	26S	49S
23HH	FLH	6L	0	20L	53L	9S	50L	0	26L
24HH	SRL	0	0	0	0	0	0	0	7S
24HH	SRH	13L	16L	31L	25L	46L	0	0	0
24HH	SCL	41L	12L	0	36L	0	0	8S	0
24HH	SCH	27L	13L	29L	0	36L	0	9L	0
24HH	SLL	0	0	0	0	36L	0	0	0
24HH	SLH	12L	0	0	0	0	0	6L	30L
24HH	FRL	0	54L	13S	38S	95S	47S	88S	100S
24HH	FRH	14L	14L	18L	0	20S	27S	22S	0
24HH	FCL	1L	26L	0	52S	26S	37S	36S	29S
24HH	FCH	50L	0	0	0	0	0	0	12S
24HH	FLL	14S	39L	52S	55S	42S	28S	43S	41S
24HH	FLH	0	16L	46S	8S	48S	0	1S	3L

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
25HH	SRL	0	0	26S	23S	5S	0	1S	8L
25HH	SRH	14L	11L	6S	14S	4L	19S	16L	9L
25HH	SCL	0	17S	15S	14S	0	5S	13S	31S
25HH	SCH	17S	14S	55L	19S	0	0	10L	14S
25HH	SLL	0	18S	32S	22S	0	0	0	0
25HH	SLH	0	0	0	17S	13L	0	0	0
25HH	FRL	109S	0	75S	55S	119S	42S	134S	68S
25HH	FRH	22S	129S	30S	0	0	0	0	49S
25HH	FCL	40S	77S	28S	70S	0	28S	1S	35S
25HH	FCH	91S	18S	0	0	11S	0	24S	0
25HH	FLL	77S	50S	79S	8S	78S	36S	48S	24S
25HH	FLH	2S	74S	0	0	23S	14S	0	0
26HH	SRL	34L	6L	12L	4L	1L	2L	0	8L
26HH	SRH	0	26L	41L	25L	20L	37L	38L	23L
26HH	SCL	19L	15L	4L	0	0	0	0	0
26HH	SCH	37L	60L	65L	11L	39L	41L	25L	27L
26HH	SLL	12L	33L	17L	14L	62L	0	0	0
26HH	SLH	24L	26L	5L	21L	28L	28L	21L	16L
26HH	FRL	29L	27L	16L	0	86S	31S	2S	24S
26HH	FRH	52L	33L	30L	0	11L	0	31L	21L
26HH	FCL	1S	0	0	0	0	8S	22L	5S
26HH	FCH	95L	32S	60L	0	0	14L	70L	0
26HH	FLL	58L	40L	15L	13S	7S	5S	26S	23S
26HH	FLH	7S	86L	15L	0	23L	3L	0	19L
27HH	SRL	32L	24L	0	0	4L	11L	1S	7S
27HH	SRH	23L	80L	17L	48L	0	0	0	20L
27HH	SCL	63L	16L	20L	37L	0	0	0	0
27HH	SCH	59L	52L	39L	51L	40L	28L	25L	16L
27HH	SLL	82L	63L	0	3L	0	22L	0	6S
27HH	SLH	116L	117L	48L	53L	40L	24L	68L	66L
27HH	FRL	12S	0	52S	53S	37S	32S	65S	49S
27HH	FRH	11L	10L	0	38L	16L	43L	36L	28L
27HH	FCL	30L	10L	0	2L	0	8S	0	7L
27HH	FCH	41L	53L	50L	17L	25L	33L	56L	40L
27HH	FLL	0	0	0	2S	0	2L	15L	2L
27HH	FLH	48L	68L	0	39L	35L	40L	18L	35L
28HL	SRL	88L	92L	114L	71L	60L	72L	59L	13L
28HL	SRH	88L	97L	164L	127L	112L	65L	68L	56L
28HL	SCL	56L	69L	81L	62L	76L	32L	74L	43L
28HL	SCH	82L	126L	124L	153L	116L	140L	104L	145L
28HL	SLL	94L	69L	73L	110L	96L	52L	64L	26L
28HL	SLH	101L	123L	127L	154L	131L	112L	129L	110L
28HL	FRL	16S	97S	0	62S	79S	58S	76S	75S
28HL	FRH	0	12S	0	29L	19S	0	13S	21S
28HL	FCL	83S	7S	39S	0	45S	63S	38S	38S
28HL	FCH	0	76S	4S	29S	0	13S	114S	0
28HL	FLL	79S	12S	22S	53S	50S	26S	45S	41S
28HL	FLH	0	0	13S	87S	5L	0	2S	0

DEVIATION SCORES--DISTANCE (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
29HL	SRL	0	21L	29L	26L	42L	34L	30L	29L
29HL	SRH	60L	45L	41L	28L	60L	23L	38L	30L
29HL	SCL	0	36L	16L	25L	14L	9L	12L	17L
29HL	SCH	0	33L	56L	45L	31L	24L	38L	35L
29HL	SLL	25L	41L	48L	55L	39L	36L	39L	29L
29HL	SLH	36L	64L	48L	74L	57L	66L	59L	52L
29HL	FRL	90S	113S	121S	108S	127S	124S	115S	106S
29HL	FRH	58S	37S	58S	16S	83S	66S	78S	72S
29HL	FCL	128S	123S	59S	101S	119S	129S	77S	74S
29HL	FCH	90S	83S	30S	65S	52S	108S	55S	34S
29HL	FLL	108S	92S	102S	99S	105S	108S	114S	92S
29HL	FLH	81S	63S	52S	68S	74S	64S	65S	40S
30HL	SRL	45L	74L	51L	115L	76L	93L	97L	60L
30HL	SRH	120L	71L	130L	206L	126L	140L	67L	107L
30HL	SCL	66L	5L	122L	21L	100L	63L	98L	53L
30HL	SCH	182L	162L	164L	162L	48L	122L	115L	136L
30HL	SLL	113L	112L	120L	134L	138L	128L	97L	120L
30HL	SLH	130L	165L	30L	127L	199L	107L	100L	185L
30HL	FRL	32S	23S	8L	94S	18S	7S	0	0
30HL	FRH	32L	22L	16L	15L	0	7L	27L	0
30HL	FCL	28L	9L	0	22L	0	0	13S	6S
30HL	FCH	20L	65L	30L	39L	33L	33L	18L	23S
30HL	FLL	20S	0	7S	0	21S	48S	0	74S
30HL	FLH	21L	19L	17L	78L	12L	8L	0	0
31HL	SRL	93L	102L	44L	50L	2L	44L	60L	0
31HL	SRH	84L	172L	127L	125L	72L	44L	60L	47L
31HL	SCL	20L	17L	32L	26L	10L	57L	0	0
31HL	SCH	136L	51L	182L	96L	116L	59L	35L	10L
31HL	SLL	36L	43L	20L	87L	0	0	0	26L
31HL	SLH	195L	116L	82L	45L	94L	30L	27L	27L
31HL	FRL	17S	0	27S	0	35S	39S	12S	9S
31HL	FRH	27L	5L	28L	0	0	9L	0	0
31HL	FCL	11S	28S	17L	0	60S	42S	11S	6L
31HL	FCH	56L	39L	18L	0	0	33L	24L	0
31HL	FLL	11L	16L	0	14S	29S	18S	32S	23S
31HL	FLH	65L	54L	58L	0	29L	26L	0	0
32HL	SRL	71L	44L	0	3L	26L	23L	24L	29L
32HL	SRH	138L	89L	30L	17L	60L	41L	5L	96L
32HL	SCL	20L	18L	6L	0	0	0	5S	0
32HL	SCH	56L	19L	31L	12L	33L	37L	38L	20L
32HL	SLL	0	16L	17L	17L	10L	21L	19L	25L
32HL	SLH	125L	52L	105L	0	66L	20L	29L	14L
32HL	FRL	121S	96S	68S	105S	120S	120S	115S	94S
32HL	FRH	53S	29S	41S	60S	82S	61S	65S	87S
32HL	FCL	74S	71S	44S	171S	87S	66S	107S	79S
32HL	FCH	40S	44S	15S	50S	33S	52S	14S	12S
32HL	FLL	22S	83S	77S	66S	91S	107S	88S	81S
32HL	FLH	42S	61S	60S	65S	50S	121S	51S	25S

DEVIATION SCORES--DISTANCE (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
33HL	SRL	145L	127L	138L	144L	164L	138L	136L	158L
33HL	SRH	148L	197L	208L	187L	185L	188L	188L	185L
33HL	SCL	136L	63L	139L	113L	109L	114L	115L	116L
33HL	SCH	67L	203L	178L	182L	240L	164L	219L	203L
33HL	SLL	45L	135L	155L	110L	108L	88L	124L	118L
33HL	SLH	173L	187L	237L	166L	140L	169L	182L	173L
33HL	FRL	0	7S	0	0	1S	0	0	0
33HL	FRH	0	18L	23L	6S	0	0	0	2L
33HL	FCL	0	0	0	0	0	0	21S	20S
33HL	FCH	14L	23L	26L	19L	15L	7L	3L	25L
33HL	FLL	45S	67S	7S	37S	26S	48S	43S	25S
33HL	FLH	8L	46S	0	12S	0	0	0	30S
34HL	SRL	52L	7L	9L	0	0	0	0	9L
34HL	SRH	68L	24L	0	10L	31L	22L	18L	21L
34HL	SCL	12L	0	0	12L	0	0	0	0
34HL	SCH	35L	43L	3L	12L	15L	21L	5L	9L
34HL	SLL	74L	3L	24L	33L	19L	26L	0	1L
34HL	SLH	75L	36L	39L	44L	15L	62L	27L	199L
34HL	FRL	112S	115S	145S	149S	211S	172S	154S	173S
34HL	FRH	88S	124S	116S	128S	120S	144S	98S	144S
34HL	FCL	130S	176S	183S	169S	176S	176L	152S	157S
34HL	FCH	137S	120S	149S	160S	120S	156S	158S	151S
34HL	FLL	122S	143S	161S	135S	149S	150S	140S	161S
34HL	FLH	77S	101S	120S	126S	116S	124S	126S	140S
35HL	SRL	63L	4L	27L	30L	45L	20L	0	28L
35HL	SRH	83L	162L	96L	17L	89L	41L	115L	65L
35HL	SCL	65L	32L	34L	36L	26L	17L	0	0
35HL	SCH	86L	172L	26L	125L	128L	74L	54L	28L
35HL	SLL	87L	32L	36L	77L	60L	72L	3L	0
35HL	SLH	136L	30L	47L	84L	125L	88L	90L	74L
35HL	FRL	67S	46S	0	39S	159S	89S	65S	71S
35HL	FRH	11L	0	3L	10S	40S	20S	0	0
35HL	FCL	0	0	16S	17S	33S	12S	30S	20S
35HL	FCH	0	0	0	18L	8S	0	0	0
35HL	FLL	0	41S	18S	62S	83S	106S	91S	94S
35HL	FLH	37L	32S	16L	2S	60S	67S	13S	29S
36HL	SRL	108L	66L	15L	0	7L	18L	31L	1L
36HL	SRH	22L	33L	28L	30L	24L	36L	41L	42L
36HL	SCL	93L	0	13L	0	0	0	0	2L
36HL	SCH	5L	156L	67L	36L	107L	20L	94L	10L
36HL	SLL	18L	17L	9L	12L	0	6L	0	0
36HL	SLH	76L	133L	54L	142L	41L	63L	58L	43L
36HL	FRL	62S	76S	76S	66S	93S	58S	98S	79S
36HL	FRH	61S	38S	0	12S	45S	65S	59S	24S
36HL	FCL	0	67S	44S	132S	74S	116S	77S	28S
36HL	FCH	34S	31S	0	3L	25S	12S	159S	9L
36HL	FLL	73S	52S	46S	131S	79S	121S	65S	68S
36HL	FLH	29S	0	29S	56S	26S	38S	29S	0

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
37CH	SRL	0	0	0	0	0	0	0	0
37CH	SRH	10L	13S	27L	23L	10L	10L	9L	62L
37CH	SCL	3S	7L	10L	6L	0	7L	0	20L
37CH	SCH	28L	25L	27L	44L	85L	46L	25L	78L
37CH	SLL	0	0	10S	8L	21L	10L	21L	0
37CH	SLH	34L	15L	37L	35L	65L	41L	45L	31L
37CH	FRL	85S	0	2S	40S	32S	38S	94S	19S
37CH	FRH	14L	22L	49L	33L	54L	34L	34L	28L
37CH	FCL	0	0	0	0	23L	9S	0	32S
37CH	FCH	40L	66L	64L	65L	53L	75S	62L	70L
37CH	FLL	36S	50S	32S	29L	5L	25S	45S	7L
37CH	FLH	0	1L	6L	25L	42L	29L	51L	61L
38CH	SRL	29L	15L	17L	18L	20L	25L	26L	20L
38CH	SRH	31L	50L	50L	80L	95L	57L	95L	70L
38CH	SCL	34L	55L	19L	25L	23L	40L	17L	45L
38CH	SCH	40L	43L	12L	52L	58L	40L	75L	41L
38CH	SLL	49L	63L	50L	50L	30L	45L	55L	29L
38CH	SLH	40L	65L	60L	63L	69L	57L	60L	60L
38CH	FRL	22S	0	2S	0	19S	20S	39S	38S
38CH	FRH	8L	24L	1L	6L	3L	8L	5L	7L
38CH	FCL	17L	0	2S	9L	1L	5L	5L	12L
38CH	FCH	26L	25L	38L	38L	44L	36L	31L	48L
38CH	FLL	0	0	28S	0	0	9S	12S	12S
38CH	FLH	33L	14L	22L	20L	18L	38L	48L	46L
39CH	SRL	0	0	0	28L	5L	0	0	0
39CH	SRH	2S	3S	0	0	0	0	0	0
39CH	SCL	0	0	0	0	0	0	0	0
39CH	SCH	25S	15S	18S	0	21S	28S	15L	0
39CH	SLL	19S	0	0	0	0	0	0	0
39CH	SLH	14S	0	16S	0	13L	16S	15L	0
39CH	FRL	6S	17S	0	0	0	0	1L	4L
39CH	FRH	24L	0	0	5L	0	0	0	0
39CH	FCL	0	0	0	0	0	0	0	0
39CH	FCH	1L	0	0	0	0	0	0	0
39CH	FLL	16S	11S	17S	13S	14S	14S	17S	16S
39CH	FLH	0	29S	22S	19S	20S	11S	15S	19S
40CH	SRL	41L	0	0	0	0	0	0	0
40CH	SRH	11L	50L	35L	23L	32L	31L	12L	0
40CH	SCL	10L	0	3L	0	6L	0	0	0
40CH	SCH	11L	68L	41L	39L	41L	27L	52L	69L
40CH	SLL	23L	0	0	0	0	0	0	0
40CH	SLH	11L	17L	29L	56L	31L	49L	35L	0
40CH	FRL	0	10S	0	0	0	7L	5L	7L
40CH	FRH	18L	51L	9L	56L	41L	0	0	58L
40CH	FCL	0	0	0	18L	0	0	8L	12L
40CH	FCH	30L	36L	75L	32L	52L	44L	57L	65L
40CH	FLL	6S	0	0	25L	10L	0	3L	17L
40CH	FLH	27L	0	27L	7L	11L	6L	6L	4L

DEVIATION SCORES--DISTANCE (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
41CH	SRL	0	0	10S	0	0	0	0	0
41CH	SRH	0	0	0	0	0	0	8S	1L
41CH	SCL	6L	0	5S	1L	10L	3S	16S	10S
41CH	SCH	0	0	0	10L	16S	3L	10L	4L
41CH	SLL	0	11S	0	8S	10S	15S	24S	11L
41CH	SLH	16L	4S	4S	5S	5S	2S	23S	8S
41CH	FRL	13S	14S	12L	8L	0	5L	0	0
41CH	FRH	0	14L	0	10L	0	0	1L	3L
41CH	FCL	4L	0	8L	0	0	2L	0	1L
41CH	FCH	69L	72L	0	51L	38L	16L	0	10L
41CH	FLL	0	21L	0	9L	4S	7S	0	5S
41CH	FLH	0	0	5L	2L	0	0	6L	0
42CH	SRL	17S	20S	12S	15S	19S	8S	6S	13L
42CH	SRH	12S	6S	6S	10S	16S	10S	8S	15S
42CH	SCL	20S	0	16S	8S	2S	3S	6S	0
42CH	SCH	3S	15S	7S	9S	6S	2S	3S	0
42CH	SLL	22S	0	21S	10S	13S	9S	8S	14L
42CH	SLH	25S	35S	45S	21S	13S	29S	36S	34S
42CH	FRL	8S	8S	16S	7S	6S	8S	6S	6S
42CH	FRH	0	3S	0	1S	0	3S	15S	30S
42CH	FCL	7S	24S	1L	10S	6S	8S	0	15S
42CH	FCH	0	0	0	4S	20S	0	13S	5S
42CH	FLL	24S	0	0	0	5S	7S	0	5S
42CH	FLH	6S	0	0	5S	0	0	22S	0
43CH	SRL	0	0	0	0	0	0	0	1L
43CH	SRH	0	7S	15S	7S	0	36S	15S	6S
43CH	SCL	2S	4L	7L	7L	11L	0	0	0
43CH	SCH	0	14L	29S	16S	13S	0	20L	15L
43CH	SLL	0	2L	3L	9S	1L	16L	6L	15L
43CH	SLH	13L	21L	30S	15S	0	0	12L	14S
43CH	FRL	0	27S	55S	21S	55S	54S	30S	55S
43CH	FRH	12S	10S	0	0	5S	21S	16S	0
43CH	FCL	13S	20S	26S	8S	0	18S	14S	13S
43CH	FCH	14S	15S	29S	14S	17S	22S	30S	28S
43CH	FLL	15S	23S	48S	8S	21S	37S	29S	28S
43CH	FLH	6S	7S	11S	12S	15S	35S	10S	15S
44CH	SRL	15L	24L	2L	0	0	19L	0	9L
44CH	SRH	0	0	0	0	0	0	0	0
44CH	SCL	17L	13L	2L	0	7L	5L	5L	15L
44CH	SCH	0	1S	10L	5L	9L	24L	3S	4S
44CH	SLL	7L	0	21L	9L	0	14L	33L	0
44CH	SLH	15S	1S	12S	6L	11L	0	11S	26L
44CH	FRL	0	0	49S	31S	40S	81S	78S	46S
44CH	FRH	26S	32L	70S	15S	20S	68S	0	56S
44CH	FCL	0	0	0	4S	9S	0	0	0
44CH	FCH	47L	63L	0	22S	34S	20L	0	50L
44CH	FLL	15S	0	0	69S	24S	12L	0	21S
44CH	FLH	0	63S	7L	10S	17S	0	62S	0

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
45CH	SRL	15L	0	3S	7S	0	13S	0	0
45CH	SRH	0	0	6L	0	0	5L	0	0
45CH	SCL	0	0	0	0	0	0	0	0
45CH	SCH	6L	5L	0	1L	0	0	8S	0
45CH	SLL	0	0	3L	0	6L	12L	0	12L
45CH	SLH	0	13L	8L	0	0	0	0	4S
45CH	FRL	33L	12L	36L	21L	15L	56L	39L	0
45CH	FRH	97L	137L	86L	43L	37L	93L	40L	18L
45CH	FCL	15L	14L	5L	12L	7L	14L	3S	16L
45CH	FCH	0	25L	15L	13L	11L	18L	8L	13L
45CH	FLL	3L	15L	21L	8L	15L	23L	10L	43L
45CH	FLH	30L	35L	1L	16L	15L	30L	12L	34L
46CL	SRL	6L	15L	23S	20L	30L	21L	19L	29L
46CL	SRH	80L	23L	52L	43L	17L	60L	27L	57L
46CL	SCL	0	0	0	13L	0	0	18L	8L
46CL	SCH	24L	20L	36L	37L	33L	35L	39L	35L
46CL	SLL	27L	21L	10L	12L	25L	25L	5L	17L
46CL	SLH	98L	73L	34L	36L	35L	32L	35L	55L
46CL	FRL	44S	111S	35S	40S	40S	45S	7S	39S
46CL	FRH	10S	8S	0	0	8S	0	0	0
46CL	FCL	94S	60S	27S	0	15S	0	6S	3S
46CL	FCH	49S	50S	10S	17S	21S	21L	22L	6L
46CL	FLL	34S	53S	28S	28S	23S	19S	23S	11S
46CL	FLH	14S	6S	0	5S	10S	9S	0	0
47CL	SRL	74L	50L	40L	66L	95L	68L	60L	67L
47CL	SRH	64L	1S	65L	70L	71L	109L	9L	71L
47CL	SCL	24L	20L	19L	30L	34L	24L	30L	35L
47CL	SCH	86L	98L	58L	60L	56L	67L	65L	64L
47CL	SLL	104L	47L	36L	50L	50L	67L	40L	30L
47CL	SLH	87L	81L	49L	70L	81L	109L	20L	100L
47CL	FRL	94S	46S	4S	18L	27S	14L	10L	12L
47CL	FRH	23L	38L	21L	16L	0	38L	0	94L
47CL	FCL	3S	0	18L	7L	11L	0	5L	16L
47CL	FCH	0	58L	64L	51L	47L	87L	52L	39L
47CL	FLL	12S	2L	9S	6S	3S	0	5S	17L
47CL	FLH	0	21L	0	40L	28S	55L	17L	38L
48CL	SRL	43L	38L	36L	17L	38L	27L	25L	40L
48CL	SRH	42L	79L	86L	91L	49L	52L	112L	85L
48CL	SCL	10L	76L	43L	38L	0	0	29L	16L
48CL	SCH	69L	59L	71L	88L	98L	76L	85L	61L
48CL	SLL	20L	36L	16L	28L	12L	14L	10L	29L
48CL	SLH	61L	86L	83L	108L	61L	41L	37L	104L
48CL	FRL	92S	81S	67S	14S	54S	51S	47S	12S
48CL	FRH	50S	25S	22S	12S	10S	0	0	29L
48CL	FCL	20S	51S	24S	7S	0	11S	13S	3S
48CL	FCH	0	4L	0	0	9L	0	0	0
48CL	FLL	39S	75S	52S	43S	41S	21S	50L	3S
48CL	FLH	0	32S	27S	0	7S	10S	0	33L

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
49CL	SRL	48S	81S	77S	69S	72S	77S	60S	71S
49CL	SRH	0	33S	66S	47S	0	40S	54S	61S
49CL	SCL	80S	107S	75S	84S	97S	71S	82S	87S
49CL	SCH	0	12S	19S	46S	0	0	17S	0
49CL	SLL	77S	85S	82S	69S	39S	76S	71S	66S
49CL	SLH	41S	0	7S	10S	0	53S	41S	26S
49CL	FRL	158S	219S	161S	251S	136S	190S	177S	127S
49CL	FRH	46S	136S	136S	111S	80S	127S	183S	146S
49CL	FCL	175S	150S	102S	22S	160S	109S	93S	86S
49CL	FCH	43S	129S	93S	135S	0	20S	119S	98S
49CL	FLL	75S	135S	161S	209S	163S	160S	146S	133S
49CL	FLH	51S	122S	130S	178S	91S	129S	101S	93S
50CL	SRL	32L	0	0	32L	0	0	0	0
50CL	SRH	11L	36L	7L	25L	12L	0	15L	22L
50CL	SCL	3L	4L	0	0	14S	0	10L	5L
50CL	SCH	79L	55L	26L	0	33L	30L	26L	42L
50CL	SLL	68L	0	0	0	0	0	0	0
50CL	SLH	59L	183L	24L	0	23L	8L	18L	22L
50CL	FRL	47S	43S	16S	26S	49S	0	53S	47S
50CL	FRH	51S	32S	23S	0	0	51L	46S	26S
50CL	FCL	22S	7S	0	26L	0	0	0	30L
50CL	FCH	29S	0	0	0	25L	29L	33S	29S
50CL	FLL	45S	44S	34S	100S	10S	0	16S	21S
50CL	FLH	73S	27S	0	20S	33L	16L	22S	36S
51CL	SRL	50L	53L	42L	36L	45L	62L	51L	39L
51CL	SRH	64L	97L	85L	34L	112L	41L	66L	56L
51CH	SCL	0	11L	59L	76L	38L	139L	22L	31L
51CL	SCH	8L	60L	137L	118L	118L	179L	108L	100L
51CL	SLL	56L	85L	106L	101L	118L	169L	132L	156L
51CL	SLH	108L	34L	115L	184L	154L	88L	103L	133L
51CL	FRL	147S	100S	0	50S	114S	102S	98S	86S
51CL	FRH	104S	6S	54S	19S	19S	0	35S	39S
51CL	FCL	129S	71S	7S	149S	162S	85S	79S	100S
51CL	FCH	12S	0	0	68S	127S	4L	15S	0
51CL	FLL	67S	91S	17S	20S	132S	155S	103S	115S
51CL	FLH	88S	31S	4L	102S	117S	100S	108S	116S
52CL	SRL	5L	0	11L	47L	24L	42L	26L	32L
52CL	SRH	43L	78L	30L	55L	91L	52L	43L	41L
52CL	SCL	0	0	15L	0	0	0	0	0
52CL	SCH	32L	120L	48L	23L	52L	18L	36L	45L
52CL	SLL	48L	43L	46L	47L	50L	37L	41L	43L
52CL	SLH	62L	38L	42L	40L	88L	76L	72L	65L
52CL	FRL	58S	147S	87S	99S	130S	110S	100S	91S
52CL	FRH	73S	150S	79S	80S	65S	72S	86S	78S
52CL	FCL	95S	83S	89S	44S	33S	102S	78S	81S
52CL	FCH	99S	71S	0	58S	26S	62S	50S	57S
52CL	FLL	103S	103S	75S	85S	106S	61S	106S	77S
52CL	FLH	67S	31S	60S	80S	55S	63S	51S	75S

DEVIATION SCORES--DISTANCE (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
53CL	SRL	55L	63L	67L	68L	55L	59L	58L	64L
53CL	SRH	93L	96L	90L	91L	82L	106L	129L	117L
53CL	SCL	41L	46L	50L	47L	48L	57L	65L	98L
53CL	SCH	79L	111L	82L	75L	121L	126L	133L	95L
53CL	SLL	87L	69L	71L	65L	85L	83L	81L	97L
53CL	SLH	71L	87L	82L	98L	81L	90L	97L	118L
53CL	FRL	85S	55S	60S	58S	14S	36S	0	60L
53CL	FRH	56S	29S	30S	21S	29S	18S	10S	10S
53CL	FCL	24S	75S	42S	26S	24S	42S	42S	40S
53CL	FCH	31S	22S	17S	20S	0	26S	0	41L
53CL	FLL	56S	55S	61S	64S	51S	43S	25S	50S
53CL	FLH	34S	0	0	30S	0	13S	15L	25L
54CL	SRL	25L	24L	20L	16L	0	0	0	0
54CL	SRH	74L	67L	52L	44L	57L	63L	81L	64L
54CL	SCL	42L	11L	13L	7L	0	0	0	0
54CL	SCH	113L	74L	56L	47L	53L	50L	45L	25L
54CL	SLL	67L	20L	52L	64L	25L	18L	0	23L
54CL	SLH	96L	94L	62L	43L	51L	36L	25L	33L
54CL	FRL	95S	67S	70S	64S	19L	39S	60S	57S
54CL	FRH	63S	50S	47S	30S	22S	46S	40S	30L
54CL	FCL	88S	58S	71S	60S	71L	41S	0	32S
54CL	FCH	28S	12S	15S	12S	0	25S	36L	30S
54CL	FLL	77S	49S	58S	51S	50S	47S	44S	0
54CL	FLH	20S	49S	35S	50S	25S	37S	40S	30S

DEVIATION SCORES--RADIAL ERROR

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
01JH	SRL	22	0	8	21	11	12	5	10
01JH	SRH	6	13	14	0	19	16	9	9
01JH	SCL	43	0	7	1	26	4	32	8
01JH	SCH	0	9	12	61	18	2	7	11
01JH	SLL	20	11	3	0	3	0	10	5
01JH	SLH	26	31	5	0	0	0	0	0
01JH	FRL	14	12	7	12	17	46	43	17
01JH	FRH	58	77	61	54	13	59	16	26
01JH	FCL	21	15	41	0	39	43	6	18
01JH	FCH	69	48	58	7	0	10	11	14
01JH	FLL	16	22	23	7	24	13	17	14
01JH	FLH	30	41	41	29	9	0	0	21
02JH	SRL	0	18	19	17	33	28	12	16
02JH	SRH	21	42	30	61	51	46	58	43
02JH	SCL	10	17	10	27	8	20	15	15
02JH	SCH	0	52	51	36	40	51	74	40
02JH	SLL	2	56	35	22	45	41	58	36
02JH	SLH	14	15	5	10	7	5	5	8
02JH	FRL	61	71	69	110	115	127	75	73
02JH	FRH	68	37	34	25	83	69	31	42
02JH	FCL	43	42	63	107	99	96	54	63
02JH	FCH	10	14	15	15	17	31	12	14
02JH	FLL	47	44	68	103	74	73	69	68
02JH	FLH	15	10	0	4	3	14	5	7
03JH	SRL	23	0	7	10	0	23	0	16
03JH	SRH	59	45	80	59	107	0	20	108
03JH	SCL	5	0	0	0	1	0	0	7
03JH	SCH	47	77	39	31	2	14	0	19
03JH	SLL	6	13	0	9	14	28	0	27
03JH	SLH	29	111	126	54	57	7	22	29
03JH	FRL	106	60	27	67	80	112	50	67
03JH	FRH	15	25	40	38	31	29	36	63
03JH	FCL	67	8	11	29	52	73	0	6
03JH	FCH	20	16	78	19	7	0	28	0
03JH	FLL	10	0	12	0	15	28	0	5
03JH	FLH	17	54	80	32	30	19	7	32
04JH	SRL	41	40	14	17	3	13	0	8
04JH	SRH	75	87	87	69	57	56	44	77
04JH	SCL	38	10	14	8	0	0	8	4
04JH	SCH	66	82	89	73	54	55	92	46
04JH	SLL	60	5	22	9	20	29	10	12
04JH	SLH	69	80	84	76	74	84	104	48
04JH	FRL	41	23	2	33	92	63	8	8
04JH	FRH	23	8	15	10	8	17	16	0
04JH	FCL	10	49	23	18	43	22	0	6
04JH	FCH	19	19	7	14	22	19	18	12
04JH	FLL	26	59	8	25	8	34	48	15
04JH	FLH	14	0	0	5	2	12	8	10

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
05JH	SRL	19	0	30	12	42	0	0	12
05JH	SRH	26	80	43	1	0	56	12	37
05JH	SCL	4	23	0	3	18	0	1	4
05JH	SCH	34	31	65	0	4	109	19	27
05JH	SLL	7	14	4	20	28	17	6	12
05JH	SLH	32	9	44	28	63	14	39	32
05JH	FRL	11	11	48	31	21	21	12	20
05JH	FRH	30	64	37	23	28	35	2	30
05JH	FCL	30	36	10	60	80	17	99	12
05JH	FCH	29	32	23	26	0	0	0	12
05JH	FLL	24	9	42	10	25	43	9	22
05JH	FLH	3	0	3	6	4	0	0	0
06JH	SRL	16	24	0	0	0	6	0	0
06JH	SRH	14	8	0	5	5	0	23	7
06JH	SCL	27	0	21	0	7	0	31	16
06JH	SCH	14	1	36	31	64	59	73	38
06JH	SLL	52	14	9	36	18	31	35	27
06JH	SLH	40	0	12	17	0	6	28	11
06JH	FRL	27	13	13	39	8	8	6	15
06JH	FRH	97	52	50	27	34	33	39	37
06JH	FCL	11	48	15	3	0	0	0	0
06JH	FCH	64	97	63	53	78	46	43	63
06JH	FLL	19	35	17	18	12	29	0	14
06JH	FLH	47	37	65	0	66	58	62	52
07JH	SRL	4	5	5	0	0	0	13	17
07JH	SRH	52	21	16	38	4	0	3	5
07JH	SCL	61	75	27	12	27	19	5	6
07JH	SCH	4	0	4	17	6	9	2	0
07JH	SLL	12	19	13	14	10	18	12	13
07JH	SLH	40	9	23	44	29	0	38	2
07JH	FRL	52	52	50	45	40	53	42	70
07JH	FRH	48	22	21	24	22	16	8	17
07JH	FCL	26	18	8	0	0	6	0	6
07JH	FCH	5	2	0	0	4	0	23	0
07JH	FLL	28	17	13	10	19	7	0	10
07JH	FLH	5	19	0	0	8	0	0	0
08JH	SRL	14	0	5	0	3	6	0	10
08JH	SRH	24	37	22	7	38	38	9	18
08JH	SCL	59	59	30	0	0	0	39	46
08JH	SCH	69	89	65	88	7	55	62	83
08JH	SLL	14	6	10	23	10	0	14	19
08JH	SLH	87	17	19	47	73	24	12	16
08JH	FRL	102	115	111	56	151	112	132	118
08JH	FRH	81	82	62	95	96	82	43	54
08JH	FCL	95	56	92	80	122	118	82	99
08JH	FCH	74	51	51	31	36	57	71	94
08JH	FLL	86	100	103	73	129	92	125	116
08JH	FLH	61	70	70	42	108	113	68	31

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
09JH	SRL	48	22	33	16	12	24	24	26
09JH	SRH	77	61	112	69	75	75	70	65
09JH	SCL	2	23	8	10	8	11	3	26
09JH	SCH	64	98	102	89	106	85	65	76
09JH	SLL	16	56	29	61	34	37	10	63
09JH	SLH	91	89	83	99	67	79	90	38
09JH	FRL	25	50	63	47	33	43	27	77
09JH	FRH	28	20	14	22	26	20	18	29
09JH	FCL	11	6	10	13	12	9	18	4
09JH	FCH	32	24	9	5	8	13	8	4
09JH	FLL	53	14	12	0	16	16	16	34
09JH	FLH	0	50	20	25	18	18	2	0
10JL	SRL	17	0	0	14	20	41	56	54
10JL	SRH	42	31	27	34	28	51	44	4
10JL	SCL	56	0	0	0	0	0	10	0
10JL	SCH	41	16	38	154	37	91	3	37
10JL	SLL	6	12	3	45	33	23	62	67
10JL	SLH	22	0	31	128	31	6	13	44
10JL	FRL	104	68	25	45	67	25	146	51
10JL	FRH	47	6	0	22	25	21	34	44
10JL	FCL	34	12	21	0	26	86	39	11
10JL	FCH	1	14	15	41	0	0	2	8
10JL	FLL	45	58	10	23	45	37	117	98
10JL	FLH	16	40	13	0	13	48	0	5
11JL	SRL	75	45	23	2	131	36	48	16
11JL	SRH	8	34	33	154	21	41	154	58
11JL	SCL	0	13	17	3	1	117	118	13
11JL	SCH	12	17	14	7	135	16	13	146
11JL	SLL	14	0	0	19	3	0	31	35
11JL	SLH	14	0	0	10	2	2	154	53
11JL	FRL	154	130	120	133	157	94	69	178
11JL	FRH	171	122	136	63	165	157	177	33
11JL	FCL	37	38	37	168	204	171	51	14
11JL	FCH	3	62	160	155	16	166	1	0
11JL	FLL	174	184	184	182	192	178	184	224
11JL	FLH	169	95	146	155	174	51	38	165
12JL	SRL	36	41	54	24	28	71	37	36
12JL	SRH	91	82	136	124	16	39	22	39
12JL	SCL	64	161	102	36	2	0	1	61
12JL	SCH	8	31	147	56	23	28	25	65
12JL	SLL	56	45	47	40	40	30	7	49
12JL	SLH	69	80	139	154	90	82	100	87
12JL	FRL	81	45	16	48	53	53	84	67
12JL	FRH	37	46	58	22	50	50	45	44
12JL	FCL	10	7	0	90	60	150	17	9
12JL	FCH	26	7	0	0	32	0	57	0
12JL	FLL	67	66	20	65	86	70	64	80
12JL	FLH	0	44	17	12	81	32	43	46

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
13JL	SRL	26	58	2	10	41	26	26	12
13JL	SRH	30	59	41	84	3	2	0	4
13JL	SCL	0	0	10	0	2	0	0	45
13JL	SCH	29	21	31	58	9	31	120	25
13JL	SLL	16	28	5	0	1	29	1	14
13JL	SLH	69	51	134	36	39	12	112	10
13JL	FRL	124	157	67	119	40	165	68	78
13JL	FRH	53	132	70	69	30	56	17	6
13JL	FCL	49	60	0	0	94	62	24	26
13JL	FCH	11	4	0	3	20	18	27	4
13JL	FLL	72	65	59	22	119	5	34	19
13JL	FLH	39	44	92	27	0	48	15	0
14JL	SRL	68	25	34	0	12	20	8	0
14JL	SRH	119	67	28	17	2	39	0	32
14JL	SCL	83	31	48	0	0	62	2	8
14JL	SCH	155	76	55	0	27	102	192	132
14JL	SLL	57	10	5	6	12	11	1	7
14JL	SLH	126	47	31	63	211	32	12	10
14JL	FRL	68	125	123	63	53	98	45	66
14JL	FRH	26	112	60	130	47	40	32	13
14JL	FCL	60	61	144	37	28	54	38	43
14JL	FCH	17	90	22	95	22	27	13	3
14JL	FLL	46	53	62	96	73	49	54	22
14JL	FLH	17	11	25	110	107	43	48	21
15JL	SRL	5	0	34	0	0	19	27	30
15JL	SRH	41	46	54	78	67	56	110	80
15JL	SCL	18	94	63	99	15	11	9	6
15JL	SCH	155	160	175	130	185	121	55	70
15JL	SLL	26	7	46	101	31	41	24	22
15JL	SLH	88	113	138	108	122	115	95	102
15JL	FRL	40	133	50	35	76	70	87	42
15JL	FRH	15	34	50	34	38	23	43	6
15JL	FCL	0	19	23	16	34	19	6	12
15JL	FCH	19	0	20	6	6	15	21	0
15JL	FLL	10	3	0	2	9	12	38	29
15JL	FLH	51	2	19	3	44	11	8	0
16JL	SRL	143	30	38	28	0	1	34	37
16JL	SRH	35	17	47	52	59	26	13	29
16JL	SCL	0	0	10	9	29	21	13	7
16JL	SCH	48	33	28	22	13	26	0	30
16JL	SLL	0	47	49	0	0	16	3	45
16JL	SLH	9	3	64	5	17	2	22	9
16JL	FRL	120	57	70	38	143	144	60	126
16JL	FRH	50	31	25	43	43	115	68	53
16JL	FCL	27	39	62	166	41	7	28	39
16JL	FCH	31	32	9	154	174	153	117	120
16JL	FLL	22	42	16	19	66	209	101	124
16JL	FLH	0	17	1	22	0	2	15	9

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
17JL	SRL	25	4	107	68	47	37	0	0
17JL	SRH	83	50	92	75	142	47	147	77
17JL	SCL	65	41	18	36	24	107	11	180
17JL	SCH	87	18	62	80	131	168	56	38
17JL	SLL	42	0	0	78	75	0	16	42
17JL	SLH	98	42	65	155	150	80	45	44
17JL	FRL	30	174	25	32	26	33	37	27
17JL	FRH	41	53	50	34	51	35	29	30
17JL	FCL	18	59	0	2	26	1	26	3
17JL	FCH	20	33	12	41	18	26	9	17
17JL	FLL	0	0	12	0	19	10	12	24
17JL	FLH	76	81	0	28	33	14	77	32
18JL	SRL	11	0	0	0	0	13	21	23
18JL	SRH	22	25	29	16	33	21	36	35
18JL	SCL	16	9	0	3	0	13	2	0
18JL	SCH	24	21	11	16	0	9	105	26
18JL	SLL	21	24	17	59	66	0	0	25
18JL	SLH	68	40	27	42	49	44	40	27
18JL	FRL	55	81	30	27	77	133	78	92
18JL	FRH	87	61	47	75	120	36	37	45
18JL	FCL	107	77	129	15	171	56	31	170
18JL	FCH	108	68	110	10	20	17	5	40
18JL	FLL	101	95	9	51	57	29	81	111
18JL	FLH	20	61	45	66	25	0	47	0
19HH	SRL	61	53	48	58	0	9	34	9
19HH	SRH	146	68	94	10	33	69	64	30
19HH	SCL	88	55	0	1	0	0	20	0
19HH	SCH	165	149	67	24	17	0	62	12
19HH	SLL	18	41	41	23	15	14	23	11
19HH	SLH	148	72	40	70	58	15	64	51
19HH	FRL	71	46	29	45	18	20	37	41
19HH	FRH	78	38	54	24	35	11	30	13
19HH	FCL	70	0	44	28	84	16	43	64
19HH	FCH	67	62	27	0	3	21	23	12
19HH	FLL	24	31	28	25	16	0	17	19
19HH	FLH	62	35	42	33	30	24	39	54
20HH	SRL	52	57	39	0	0	12	0	19
20HH	SRH	72	58	54	0	1	0	4	26
20HH	SCL	36	33	28	0	0	11	2	52
20HH	SCH	112	66	90	36	35	26	0	41
20HH	SLL	69	65	88	42	20	18	0	56
20HH	SLH	105	112	77	66	9	18	0	26
20HH	FRL	11	13	0	44	38	33	27	23
20HH	FRH	23	7	47	22	14	7	0	10
20HH	FCL	0	21	53	13	25	20	14	17
20HH	FCH	20	36	40	0	0	6	20	9
20HH	FLL	37	8	15	42	42	46	12	26
20HH	FLH	26	0	10	34	0	1	11	0

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
21HH	SRL	27	39	66	59	9	0	27	0
21HH	SRH	40	50	76	3	34	38	12	50
21HH	SCL	16	29	26	25	0	0	20	0
21HH	SCH	62	45	41	14	1	23	1	0
21HH	SLL	52	25	34	34	20	10	2	14
21HH	SLH	73	40	106	73	0	3	25	0
21HH	FRL	9	29	29	19	69	77	8	0
21HH	FRH	133	52	42	2	0	17	45	40
21HH	FCL	12	0	36	12	0	17	22	9
21HH	FCH	92	66	82	30	31	82	65	79
21HH	FLL	14	23	33	41	40	23	11	12
21HH	FLH	32	21	27	60	51	7	64	0
22HH	SRL	13	26	24	2	9	0	7	0
22HH	SRH	23	30	35	50	131	44	69	25
22HH	SCL	39	17	0	66	11	0	0	3
22HH	SCH	9	13	22	18	16	54	15	20
22HH	SLL	17	15	24	23	13	20	0	11
22HH	SLH	17	48	40	38	81	28	42	21
22HH	FRL	10	80	19	14	9	1	29	0
22HH	FRH	27	24	52	31	39	35	33	23
22HH	FCL	14	46	30	5	20	10	5	9
22HH	FCH	70	69	45	0	19	52	36	11
22HH	FLL	32	27	25	15	9	0	7	3
22HH	FLH	30	31	34	48	33	44	18	23
23HH	SRL	31	3	14	8	9	32	0	19
23HH	SRH	25	31	22	15	13	33	16	25
23HH	SCL	4	1	8	0	9	31	15	0
23HH	SCH	6	4	13	30	5	9	10	23
23HH	SLL	15	26	13	4	0	9	14	29
23HH	SLH	10	20	30	23	25	80	21	56
23HH	FRL	38	27	43	45	32	22	40	18
23HH	FRH	62	68	30	42	32	0	13	8
23HH	FCL	45	0	25	23	31	25	18	33
23HH	FCH	49	38	26	27	5	43	18	18
23HH	FLL	0	20	45	2	24	21	26	49
23HH	FLH	6	0	20	53	9	50	18	26
24HH	SRL	0	0	0	1	2	0	0	8
24HH	SRH	16	16	31	25	46	0	0	2
24HH	SCL	41	12	0	40	0	6	8	0
24HH	SCH	30	13	29	0	36	0	9	0
24HH	SLL	35	10	0	21	36	0	23	0
24HH	SLH	23	0	0	0	0	0	6	30
24HH	FRL	19	54	15	38	95	47	88	100
24HH	FRH	14	18	20	0	26	33	34	8
24HH	FCL	6	27	27	53	26	37	36	29
24HH	FCH	51	8	0	8	30	8	0	12
24HH	FLL	34	40	55	59	42	28	45	41
24HH	FLH	30	20	47	34	48	10	1	3

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
25HH	SRL	0	0	26	23	9	0	1	8
25HH	SRH	14	11	6	14	6	19	16	9
25HH	SCL	7	21	15	14	8	5	13	31
25HH	SCH	18	14	57	21	0	0	10	14
25HH	SLL	0	21	32	22	0	0	4	0
25HH	SLH	0	0	0	17	14	0	4	0
25HH	FRL	109	0	75	55	119	42	134	68
25HH	FRH	22	129	30	0	8	5	14	49
25HH	FCL	40	77	46	70	0	28	1	35
25HH	FCH	91	18	0	4	11	0	25	0
25HH	FLL	77	50	79	8	78	36	48	24
25HH	FLH	2	74	6	0	23	14	0	1
26HH	SRL	34	6	12	4	1	2	0	8
26HH	SRH	0	26	41	26	20	37	38	23
26HH	SCL	22	15	4	43	2	2	0	9
26HH	SCH	37	60	69	11	39	41	28	27
26HH	SLL	25	33	21	14	62	36	8	22
26HH	SLH	24	26	5	21	28	35	21	23
26HH	FRL	29	30	17	6	92	43	8	25
26HH	FRH	54	46	46	29	23	32	40	33
26HH	FCL	17	4	39	0	1	8	24	5
26HH	FCH	100	32	63	6	0	21	71	14
26HH	FLL	67	40	19	13	7	5	26	14
26HH	FLH	7	86	15	0	23	30	0	19
27HH	SRL	34	24	0	0	4	11	1	7
27HH	SRH	23	80	16	48	0	0	0	20
27HH	SCL	63	16	20	37	0	0	0	0
27HH	SCH	59	54	39	51	40	28	25	22
27HH	SLL	82	63	0	3	0	22	0	6
27HH	SLH	117	117	51	53	40	24	68	66
27HH	FRL	12	23	52	53	37	32	65	49
27HH	FRH	11	15	16	43	17	43	51	31
27HH	FCL	30	17	1	2	9	92	0	8
27HH	FCH	41	57	50	17	25	33	56	40
27HH	FLL	0	0	0	4	0	2	15	2
27HH	FLH	48	69	21	39	35	40	18	35
28HL	SRL	89	92	114	0	60	72	59	13
28HL	SRH	88	97	166	129	112	65	68	56
28HL	SCL	58	69	82	62	76	32	74	43
28HL	SCH	82	126	124	153	116	140	104	146
28HL	SLL	94	71	73	110	96	52	64	26
28HL	SLH	101	123	127	155	131	112	129	110
28HL	FRL	62	102	15	68	80	63	78	75
28HL	FRH	36	34	37	38	33	34	42	32
28HL	FCL	85	7	39	4	45	63	38	41
28HL	FCH	0	79	4	29	0	14	114	0
28HL	FLL	79	15	22	53	50	26	45	41
28HL	FLH	6	0	15	88	11	0	2	22

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
29HL	SRL	5	23	29	26	42	34	30	29
29HL	SRH	63	50	42	28	60	29	38	30
29HL	SCL	2	36	16	25	14	9	12	17
29HL	SCH	15	33	56	45	31	24	38	35
29HL	SLL	26	41	48	55	39	36	39	29
29HL	SLH	39	65	48	74	57	66	52	59
29HL	FRL	92	115	124	112	129	126	117	108
29HL	FRH	64	65	61	42	87	71	81	74
29HL	FCL	128	124	59	101	119	130	77	74
29HL	FCH	90	83	30	65	52	108	55	34
29HL	FLL	108	92	102	99	105	108	114	92
29HL	FLH	81	64	54	70	74	67	65	58
30HL	SRL	47	74	51	115	76	93	97	60
30HL	SRH	120	71	130	206	126	140	67	107
30HL	SCL	66	5	122	31	100	64	98	53
30HL	SCH	182	162	164	162	48	122	115	136
30HL	SLL	113	113	120	134	139	131	97	121
30HL	SLH	130	167	30	128	201	107	100	185
30HL	FRL	6	23	8	94	18	7	13	0
30HL	FRH	35	22	19	21	32	8	25	9
30HL	FCL	28	9	38	22	0	4	13	6
30HL	FCH	20	65	30	45	33	33	19	23
30HL	FLL	20	0	16	0	26	49	6	74
30HL	FLH	47	21	25	78	12	9	0	5
31HL	SRL	93	102	44	50	2	44	60	0
31HL	SRH	84	172	127	125	72	44	60	41
31HL	SCL	20	17	39	28	10	57	0	0
31HL	SCH	137	105	182	96	116	59	35	10
31HL	SLL	36	45	20	87	0	0	0	26
31HL	SLH	195	116	82	45	94	30	27	27
31HL	FRL	18	1	33	12	40	39	12	9
31HL	FRH	37	57	29	2	20	28	27	51
31HL	FCL	12	28	20	5	60	42	11	6
31HL	FCH	56	39	18	0	0	33	24	10
31HL	FLL	11	16	0	14	29	18	32	23
31HL	FLH	65	54	59	0	29	26	0	0
32HL	SRL	71	44	0	3	26	23	24	29
32HL	SRH	138	89	30	17	60	41	5	96
32HL	SCL	20	28	8	9	0	0	6	0
32HL	SCH	56	24	31	12	33	37	43	20
32HL	SLL	22	18	25	23	10	21	19	25
32HL	SLH	125	53	106	27	66	20	32	14
32HL	FRL	123	101	83	107	121	122	115	94
32HL	FRH	73	70	42	68	95	68	66	87
32HL	FCL	91	74	50	171	89	67	110	79
32HL	FCH	47	51	51	50	37	52	21	14
32HL	FLL	22	83	77	66	91	107	88	81
32HL	FLH	42	61	60	65	50	121	51	25

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
33HL	SRL	146	128	138	144	164	139	137	158
33HL	SRH	148	198	208	187	185	188	188	185
33HL	SCL	136	63	139	113	109	114	115	116
33HL	SCH	78	203	178	184	240	167	220	203
33HL	SLL	49	137	155	111	108	89	124	118
33HL	SLH	184	187	238	166	141	169	182	173
33HL	FRL	19	26	17	10	3	34	11	4
33HL	FRH	25	30	42	12	0	13	2	6
33HL	FCL	26	0	0	12	50	0	21	20
33HL	FCH	20	23	52	23	15	7	3	33
33HL	FLL	47	69	8	37	26	48	43	25
33HL	FLH	8	60	0	12	31	0	0	30
34HL	SRL	60	7	11	0	0	0	0	11
34HL	SRH	73	29	0	11	49	24	20	22
34HL	SCL	12	0	0	12	0	0	0	21
34HL	SCH	35	47	16	14	23	23	5	12
34HL	SLL	74	3	24	33	19	26	0	1
34HL	SLH	75	36	39	44	18	62	27	199
34HL	FRL	113	117	145	152	212	175	155	174
34HL	FRH	92	125	117	129	124	148	107	160
34HL	FCL	133	177	184	171	177	176	153	157
34HL	FCH	137	121	149	161	122	161	158	152
34HL	FLL	122	143	161	135	149	150	142	161
34HL	FLH	78	102	120	126	117	124	126	161
35HL	SRL	63	4	27	30	45	20	0	28
35HL	SRH	83	163	96	17	89	41	115	65
35HL	SCL	65	37	36	36	26	17	0	0
35HL	SCH	86	172	26	125	128	74	54	31
35HL	SLL	87	32	40	77	60	72	5	0
35HL	SLH	136	30	47	84	125	88	90	74
35HL	FRL	70	53	25	41	161	91	68	72
35HL	FRH	75	56	24	36	51	40	6	19
35HL	FCL	26	0	17	17	33	12	31	20
35HL	FCH	2	0	0	18	9	0	0	0
35HL	FLL	0	41	18	62	83	106	91	94
35HL	FLH	38	33	23	3	60	67	0	29
36HL	SRL	108	66	16	2	7	18	31	1
36HL	SRH	27	33	28	28	24	36	41	42
36HL	SCL	93	7	13	5	0	0	0	2
36HL	SCH	67	174	67	42	107	20	94	10
36HL	SLL	18	17	9	25	0	7	0	0
36HL	SLH	76	133	54	142	41	63	58	43
36HL	FRL	64	78	77	67	94	58	98	79
36HL	FRH	65	44	37	32	46	69	61	36
36HL	FCL	24	68	44	137	74	116	80	28
36HL	FCH	34	47	0	4	25	12	159	9
36HL	FLL	73	52	46	131	79	121	65	68
36HL	FLH	29	0	29	56	26	38	29	0

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
37CH	SRL	0	0	0	0	0	0	0	0
37CH	SRH	10	13	27	23	10	10	9	62
37CH	SCL	3	7	10	6	14	7	8	20
37CH	SCH	28	25	27	44	85	46	25	78
37CH	SLL	10	14	16	9	21	13	21	8
37CH	SLH	34	15	37	35	65	41	45	31
37CH	FRL	85	0	2	41	32	39	97	24
37CH	FRH	23	25	49	34	54	36	38	30
37CH	FCL	13	7	21	10	25	16	0	41
37CH	FCH	40	68	64	66	54	75	63	73
37CH	FLL	37	50	32	29	5	25	46	7
37CH	FLH	0	1	6	34	42	29	51	63
38CH	SRL	29	15	17	18	20	28	26	20
38CH	SRH	31	50	50	80	95	57	95	71
38CH	SCL	34	55	19	25	23	40	17	45
38CH	SCH	40	43	12	52	58	40	75	41
38CH	SLL	55	70	50	52	31	46	55	29
38CH	SLH	40	67	64	68	74	58	62	65
38CH	FRL	23	16	2	0	19	20	39	38
38CH	FRH	8	24	24	19	30	13	5	34
38CH	FCL	35	20	2	12	9	16	6	12
38CH	FCH	27	26	40	38	44	36	31	48
38CH	FLL	12	17	36	12	0	12	13	14
38CH	FLH	35	26	30	26	19	39	48	48
39CH	SRL	0	0	4	28	5	0	0	0
39CH	SRH	2	3	0	0	0	0	0	0
39CH	SCL	0	0	0	0	4	13	0	0
39CH	SCH	25	18	18	0	23	31	15	0
39CH	SLL	19	0	0	0	0	0	0	0
39CH	SLH	14	0	16	6	13	16	15	0
39CH	FRL	5	17	0	0	0	3	1	4
39CH	FRH	27	31	26	5	23	27	18	7
39CH	FCL	6	0	0	9	5	4	0	4
39CH	FCH	4	3	4	3	3	3	3	3
39CH	FLL	16	11	25	21	24	14	23	26
39CH	FLH	0	29	22	20	20	11	15	19
40CH	SRL	41	0	0	0	0	0	0	0
40CH	SRH	11	51	35	23	32	31	12	0
40CH	SCL	10	12	15	14	15	16	12	0
40CH	SCH	11	68	41	39	41	27	52	69
40CH	SLL	23	30	23	5	16	17	12	8
40CH	SLH	11	17	30	57	37	61	35	0
40CH	FRL	20	10	0	0	0	23	11	7
40CH	FRH	21	51	18	60	44	5	2	58
40CH	FCL	15	27	15	47	21	5	8	13
40CH	FCH	30	36	75	32	52	45	57	65
40CH	FLL	19	27	11	28	24	35	26	38
40CH	FLH	27	10	27	7	11	6	9	16

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
41CH	SRL	0	0	10	0	0	0	0	0
41CH	SRH	11	0	0	0	6	0	8	2
41CH	SCL	6	0	5	1	10	3	16	10
41CH	SCH	8	6	0	10	16	3	10	4
41CH	SLL	4	11	0	8	10	15	24	19
41CH	SLH	16	4	4	5	7	2	23	8
41CH	FRL	35	14	12	11	5	5	0	0
41CH	FRH	4	21	8	10	3	2	3	10
41CH	FCL	16	1	8	3	2	5	18	1
41CH	FCH	70	72	0	51	38	19	39	10
41CH	FLL	11	22	4	12	6	8	8	14
41CH	FLH	17	1	5	2	3	3	6	0
42CH	SRL	17	20	12	15	19	8	6	13
42CH	SRH	20	6	6	10	16	10	8	15
42CH	SCL	21	0	16	8	2	4	6	0
42CH	SCH	3	15	7	9	6	2	3	0
42CH	SLL	24	10	22	10	13	12	8	17
42CH	SLH	25	35	45	21	13	29	36	34
42CH	FRL	8	11	22	12	17	9	7	11
42CH	FRH	7	6	11	6	8	13	21	31
42CH	FCL	23	25	1	11	10	11	0	15
42CH	FCH	1	0	0	4	20	0	13	5
42CH	FLL	24	5	4	0	10	9	0	7
42CH	FLH	6	0	0	5	7	0	22	0
43CH	SRL	0	0	0	0	0	0	0	13
43CH	SRH	0	7	15	7	1	36	15	17
43CH	SCL	2	4	7	7	11	0	0	0
43CH	SCH	0	14	29	16	13	2	20	20
43CH	SLL	0	2	7	9	1	16	6	15
43CH	SLH	13	21	30	15	0	0	12	14
43CH	FRL	3	27	57	29	55	58	31	55
43CH	FRH	51	19	22	29	28	41	24	21
43CH	FCL	33	22	26	9	11	19	28	18
43CH	FCH	63	43	63	29	43	38	50	57
43CH	FLL	21	24	51	24	21	37	29	30
43CH	FLH	6	7	11	12	15	35	10	32
44CH	SRL	15	24	2	0	0	19	9	9
44CH	SRH	3	2	1	1	2	0	0	0
44CH	SCL	18	15	2	0	7	5	6	15
44CH	SCH	0	1	10	5	9	24	7	4
44CH	SLL	7	0	22	9	16	14	33	0
44CH	SLH	15	7	12	6	11	0	11	29
44CH	FRL	10	19	50	31	40	81	86	46
44CH	FRH	38	53	71	21	30	72	30	64
44CH	FCL	6	4	2	4	10	0	5	0
44CH	FCH	62	67	22	38	54	20	0	58
44CH	FLL	23	12	38	86	37	18	17	49
44CH	FLH	32	84	9	22	29	16	72	15

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
45CH	SRL	15	9	3	7	0	13	0	0
45CH	SRH	0	0	15	4	2	6	6	0
45CH	SCL	10	0	0	6	0	0	0	0
45CH	SCH	10	5	0	1	0	0	8	0
45CH	SLL	4	0	3	7	7	12	9	22
45CH	SLH	0	13	8	0	1	0	0	4
45CH	FRL	32	21	37	21	16	56	39	4
45CH	FRH	97	137	86	43	38	93	40	20
45CH	FCL	20	23	6	14	11	15	4	16
45CH	FCH	5	25	19	13	14	18	8	13
45CH	FLL	3	15	23	8	18	25	10	43
45CH	FLH	30	35	10	16	15	30	12	34
46CL	SRL	6	15	23	20	30	21	19	31
46CL	SRH	80	23	52	43	17	60	27	57
46CL	SCL	4	0	7	13	0	1	18	8
46CL	SCH	24	20	36	37	33	35	39	35
46CL	SLL	28	34	13	16	25	30	9	17
46CL	SLH	98	74	34	36	35	32	38	62
46CL	FRL	44	111	35	40	40	45	11	39
46CL	FRH	24	25	12	0	10	0	0	0
46CL	FCL	99	60	42	11	22	0	6	19
46CL	FCH	55	54	34	26	22	22	22	49
46CL	FLL	34	53	28	29	23	27	31	22
46CL	FLH	14	6	21	15	16	20	13	19
47CL	SRL	74	50	40	66	95	68	60	67
47CL	SRH	64	1	65	70	71	109	9	71
47CL	SCL	25	20	19	30	34	24	30	35
47CL	SCH	86	98	58	60	56	67	65	65
47CL	SLL	104	47	36	50	50	73	41	36
47CL	SLH	88	81	49	74	82	112	20	100
47CL	FRL	95	48	4	18	27	14	10	12
47CL	FRH	33	57	22	16	0	38	0	105
47CL	FCL	3	0	33	18	25	27	20	16
47CL	FCH	1	58	81	51	47	87	52	40
47CL	FLL	12	2	9	6	3	12	5	27
47CL	FLH	0	21	0	40	28	55	17	38
48CL	SRL	43	38	36	17	38	27	25	40
48CL	SRH	42	79	86	91	49	52	112	85
48CL	SCL	10	76	43	38	4	0	29	16
48CL	SCH	69	59	71	88	98	76	85	61
48CL	SLL	20	36	19	28	18	15	13	29
48CL	SLH	61	87	0	112	62	42	39	104
48CL	FRL	93	82	70	34	60	53	47	12
48CL	FRH	51	32	28	12	10	0	16	29
48CL	FCL	20	54	26	8	4	13	24	9
48CL	FCH	0	36	20	18	21	30	25	14
48CL	FLL	39	76	52	51	43	26	55	3
48CL	FLH	0	32	27	0	13	10	7	33

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
49CL	SRL	48	81	78	69	72	78	60	71
49CL	SRH	0	33	66	48	0	40	54	61
49CL	SCL	80	107	76	84	97	71	82	87
49CL	SCH	5	13	19	46	0	13	18	0
49CL	SLL	78	86	82	71	42	76	72	67
49CL	SLH	41	0	11	10	13	53	41	26
49CL	FRL	158	219	161	251	136	190	177	127
49CL	FRH	63	137	136	111	80	127	183	146
49CL	FCL	176	150	114	22	160	109	93	86
49CL	FCH	43	129	104	135	36	30	120	100
49CL	FLL	75	136	163	210	165	161	147	134
49CL	FLH	54	122	130	178	93	129	102	93
50CL	SRL	32	1	9	32	0	12	6	0
50CL	SRH	11	36	7	25	12	0	15	22
50CL	SCL	5	4	2	0	14	0	10	5
50CL	SCH	79	56	29	0	34	30	27	42
50CL	SLL	68	0	2	0	0	0	10	11
50CL	SLH	59	184	24	0	23	8	18	22
50CL	FRL	47	44	18	28	50	33	53	47
50CL	FRH	55	32	32	28	57	51	46	26
50CL	FCL	34	15	0	26	46	23	0	30
50CL	FCH	29	42	0	12	25	29	35	34
50CL	FLL	45	44	40	100	38	16	24	35
50CL	FLH	75	29	23	25	33	23	26	36
51CL	SRL	50	53	42	36	45	62	51	39
51CL	SRH	64	97	85	34	112	41	66	56
51CL	SCL	0	11	59	76	62	139	22	31
51CL	SCH	10	60	137	121	114	179	108	100
51CL	SLL	58	93	107	109	121	171	133	157
51CL	SLH	113	35	117	189	158	89	104	137
51CL	FRL	149	104	0	50	114	102	99	86
51CL	FRH	106	20	54	33	30	37	48	48
51CL	FCL	129	99	17	149	162	85	79	101
51CL	FCH	29	0	0	68	127	4	20	11
51CL	FLL	67	91	28	27	132	156	104	116
51CL	FLH	88	31	24	103	117	101	108	117
52CL	SRL	5	2	11	47	25	42	26	32
52CL	SRH	43	78	30	55	91	52	43	41
52CL	SCL	17	18	15	3	0	0	0	0
52CL	SCH	35	120	49	23	52	19	36	45
52CL	SLL	50	45	47	50	51	38	43	43
52CL	SLH	66	38	42	40	89	76	73	65
52CL	FRL	61	148	91	99	130	110	100	91
52CL	FRH	78	151	79	80	65	72	86	78
52CL	FCL	105	89	93	44	45	106	85	85
52CL	FCH	104	81	16	63	26	80	66	64
52CL	FLL	103	103	75	85	106	61	106	77
52CL	FLH	67	31	60	80	55	63	51	75

DEVIATION SCORES--RADIAL ERROR (CONT'D)

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
53CL	SRL	55	63	67	68	55	59	58	64
53CL	SRH	93	97	90	91	82	106	129	117
53CL	SCL	41	46	50	47	48	57	65	98
53CL	SCH	79	117	83	75	121	126	133	96
53CL	SLL	87	69	71	67	85	83	81	98
53CL	SLH	71	89	83	98	82	90	97	118
53CL	FRL	87	55	60	59	18	39	13	60
53CL	FRH	65	40	40	26	29	25	16	11
53CL	FCL	24	80	45	28	28	44	47	41
53CL	FCH	35	23	18	20	0	26	0	41
53CL	FLL	56	55	61	64	51	44	27	51
53CL	FLH	35	0	0	31	0	13	15	25
54CL	SRL	25	24	20	16	0	0	11	9
54CL	SRH	74	67	52	44	57	63	81	64
54CL	SCL	42	11	13	7	0	0	0	0
54CL	SCH	113	74	56	47	53	50	45	25
54CL	SLL	72	24	52	64	33	22	0	29
54CL	SLH	98	95	65	43	52	42	41	33
54CL	FRL	96	67	70	78	19	42	60	57
54CL	FRH	68	50	51	30	41	53	40	30
54CL	FCL	94	60	72	60	71	41	3	32
54CL	FCH	40	36	25	14	0	25	36	30
54CL	FLL	77	49	58	51	54	47	44	6
54CL	FLH	20	49	35	50	38	41	40	38

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
01JH	SRL	1R	0	0	0	0	0	0	0
01JH	SRH	0	0	8R	0	17R	0	0	0
01JH	SCL	41R	0	7R	0	19R	0	0	0
01JH	SCH	0	0	9R	0	18R	1R	4R	5R
01JH	SLL	9R	11R	0	0	0	0	10R	4R
01JH	SLH	16R	3R	5R	0	0	0	0	0
01JH	FRL	14R	12R	7R	0	16R	23R	2R	9R
01JH	FRH	55R	5R	0	54R	13R	58R	16R	19R
01JH	FCL	21R	15R	0	0	35R	29R	0	14R
01JH	FCH	28R	14R	4R	0	0	0	11R	8R
01JH	FLL	10R	19R	23R	0	1R	12R	10R	11R
01JH	FLH	0	0	0	0	4R	0	13R	0
02JH	SRL	0	18R	1R	0	0	0	0	0
02JH	SRH	0	24R	4R	2R	3R	0	0	4R
02JH	SCL	9R	0	0	0	0	0	0	0
02JH	SCH	0	0	7R	0	0	1R	0	0
02JH	SLL	0	12R	0	0	1R	10R	23R	7R
02JH	SLH	0	1R	0	6R	5R	0	0	0
02JH	FRL	2R	0	0	21R	33R	18R	34R	16R
02JH	FRH	35R	37R	20R	25R	51R	30R	9R	30R
02JH	FCL	3R	3R	8R	0	60R	6R	0	11R
02JH	FCH	10R	0	15R	5R	12R	29R	12R	12R
02JH	FLL	9R	0	0	0	0	0	0	0
02JH	FLH	0	0	0	2L	0	0	0	0
03JH	SRL	0	0	0	0	0	0	0	0
03JH	SRH	4R	30R	14R	12R	28R	10R	0	0
03JH	SCL	5R	0	0	0	0	0	0	1R
03JH	SCH	0	0	24R	3R	0	0	0	0
03JH	SLL	0	0	0	7R	0	28R	0	23R
03JH	SLH	6R	7R	3R	3R	0	0	7R	0
03JH	FRL	37R	10R	27R	25R	61R	11R	11R	17R
03JH	FRH	15R	25R	40R	37R	28R	29R	30R	63R
03JH	FCL	1R	1R	11R	3R	0	3R	0	4R
03JH	FCH	12R	14R	0	7R	0	0	22R	0
03JH	FLL	10R	0	0	0	14R	0	0	0
03JH	FLH	16R	1R	0	0	0	0	3R	0
04JH	SRL	1R	4R	0	0	0	0	0	0
04JH	SRH	8R	6R	0	0	0	1R	0	0
04JH	SCL	2R	10R	0	0	0	0	8R	0
04JH	SCH	1R	3R	0	3R	0	0	0	17R
04JH	SLL	5R	0	0	9R	20R	18R	10R	12L
04JH	SLH	0	0	0	0	9R	1R	12R	0
04JH	FRL	1R	0	0	0	6R	3R	0	8R
04JH	FRH	13R	8R	10R	7R	8R	12R	0	0
04JH	FCL	0	29R	20R	9R	0	7R	0	6R
04JH	FCH	19R	0	5R	4R	0	0	8R	0
04JH	FLL	0	2R	0	12R	3R	30R	33R	15R
04JH	FLH	0	0	0	0	2R	0	8R	8R

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
05JH	SRL	1R	0	31R	12R	42R	0	3R	12R
05JH	SRH	11R	9R	9R	1R	6R	13R	7R	7R
05JH	SCL	4R	23R	0	0	0	5R	1R	4R
05JH	SCH	12R	3R	9R	0	0	0	0	3R
05JH	SLL	5R	2R	3R	15R	0	8R	6R	5R
05JH	SLH	0	1R	0	0	5R	0	4R	0
05JH	FRL	11R	10R	33R	8R	19R	15R	2R	14R
05JH	FRH	26R	58R	37R	18R	20R	35R	2R	28R
05JH	FCL	30R	35R	9R	1R	25R	6R	0	15R
05JH	FCH	9R	15R	22R	0	0	0	0	0
05JH	FLL	13R	2R	0	0	0	0	0	0
05JH	FLH	3R	0	3R	0	0	0	0	0
06JH	SRL	0	0	0	0	0	0	0	0
06JH	SRH	0	4R	0	0	0	0	0	0
06JH	SCL	0	0	0	0	0	0	0	0
06JH	SCH	12R	0	9R	0	0	0	0	0
06JH	SLL	51R	14R	9R	30R	18R	31R	35R	27R
06JH	SLH	0	0	0	15R	0	6R	28R	7R
06JH	FRL	5R	0	1R	0	8R	0	4R	0
06JH	FRH	45R	24R	6R	0	18R	11R	0	14R
06JH	FCL	0	32R	13R	3R	0	0	0	0
06JH	FCH	19R	0	5R	0	17R	0	4R	6R
06JH	FLL	16R	19R	17R	0	12R	29R	0	12R
06JH	FLH	0	24R	0	0	0	0	0	0
07JH	SRL	0	3R	0	0	0	0	0	0
07JH	SRH	16R	16R	0	0	0	0	0	0
07JH	SCL	0	0	0	0	0	0	1R	0
07JH	SCH	0	0	0	16R	0	0	0	0
07JH	SLL	0	0	0	0	0	7R	0	0
07JH	SLH	21R	0	0	0	0	0	0	0
07JH	FRL	31R	30R	21R	18R	23R	1R	9R	32R
07JH	FRH	40R	22R	20R	24R	22R	16R	2R	14R
07JH	FCL	0	0	0	0	0	0	0	0
07JH	FCH	3R	0	0	0	4R	0	23R	0
07JH	FLL	6R	0	0	0	0	0	0	0
07JH	FLH	0	0	0	0	8R	0	0	0
08JH	SRL	0	0	0	0	0	0	0	3R
08JH	SRH	16R	16R	9R	1R	17R	11R	0	0
08JH	SCL	16R	3R	0	0	0	0	0	0
08JH	SCH	0	0	0	0	0	4R	0	6R
08JH	SLL	8R	0	0	0	10R	0	0	0
08JH	SLH	0	0	0	0	0	9R	0	0
08JH	FRL	18R	31R	31R	21R	44R	27R	51R	42R
08JH	FRH	8R	26R	30R	28R	35R	62R	20R	41R
08JH	FCL	3R	0	9R	0	28R	6R	3R	22R
08JH	FCH	1R	12R	11R	0	13R	27R	16R	2R
08JH	FLL	0	0	0	0	0	1R	0	0
08JH	FLH	6R	0	0	0	0	0	0	0

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
09JH	SRL	0	0	0	0	0	0	0	11R
09JH	SRH	9R	14R	15R	9R	0	7R	0	4R
09JH	SCL	0	0	1R	0	0	0	0	12R
09JH	SCH	0	0	1R	19R	0	0	0	0
09JH	SLL	3R	20R	11R	3R	0	5R	0	0
09JH	SLH	1R	0	0	0	3R	0	0	0
09JH	FRL	25R	24R	12R	1R	4R	12R	11R	11R
09JH	FRH	28R	20R	14R	22R	13R	18R	18R	11R
09JH	FCL	7R	6R	0	10R	11R	7R	17R	0
09JH	FCH	31R	24R	5R	5R	8R	12R	0	4R
09JH	FLL	16R	12R	12R	0	0	0	0	0
09JH	FLH	0	0	0	0	0	0	0	0
10JL	SRL	17R	0	0	0	0	0	0	0
10JL	SRH	1R	29R	27R	0	26R	44R	43R	0
10JL	SCL	47R	0	0	0	0	0	0	0
10JL	SCH	0	0	0	5R	0	0	0	0
10JL	SLL	0	12R	3R	17R	21R	3R	10R	27R
10JL	SLH	0	0	0	9R	0	0	13R	0
10JL	FRL	0	0	27R	25R	24R	0	8R	31R
10JL	FRH	47R	6R	0	22R	25R	21R	34R	25R
10JL	FCL	30R	11R	0	0	10R	36R	0	3R
10JL	FCH	0	14R	0	41R	0	0	0	8R
10JL	FLL	0	0	0	23R	0	0	15R	0
10JL	FLH	13R	2R	10R	0	13R	47R	0	4R
11JL	SRL	0	0	0	2R	38R	0	0	11R
11JL	SRH	0	7R	1R	13R	6R	0	19R	9R
11JL	SCL	0	3R	0	3R	1R	6R	12R	0
11JL	SCH	0	11R	3R	0	0	16R	13R	0
11JL	SLL	13R	0	0	19R	0	0	4R	0
11JL	SLH	14R	0	0	0	2R	0	49R	0
11JL	FRL	3R	24R	23R	29R	13R	10R	47R	22R
11JL	FRH	77R	20R	65R	62R	21R	10R	20R	9R
11JL	FCL	1R	5R	0	12R	14R	14R	0	0
11JL	FCH	3R	0	0	0	0	11R	0	0
11JL	FLL	6R	0	0	0	0	24R	0	15R
11JL	FLH	0	15R	25R	2R	29R	0	11R	39R
12JL	SRL	0	2R	0	3R	3R	10R	0	0
12JL	SRH	4R	5R	2R	0	0	8R	9R	7R
12JL	SCL	0	8R	0	0	0	0	1R	0
12JL	SCH	0	0	0	0	1R	0	5R	0
12JL	SLL	0	0	0	3R	0	0	0	0
12JL	SLH	0	0	0	0	3R	1R	0	0
12JL	FRL	42R	43R	16R	34R	41R	38R	16R	37R
12JL	FRH	36R	46R	58R	21R	46R	43R	45R	42R
12JL	FCL	0	2R	0	39R	10R	0	0	0
12JL	FCH	0	7R	0	0	32R	0	39R	0
12JL	FLL	0	0	0	0	0	0	0	0
12JL	FLH	0	0	0	0	0	0	0	0

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
13JL	SRL	0	0	2R	0	0	0	0	0
13JL	SRH	10R	47R	14R	30R	3R	0	0	3R
13JL	SCL	0	0	5R	0	0	2R	0	0
13JL	SCH	0	0	0	0	3R	0	14R	5R
13JL	SLL	0	0	0	0	1R	0	0	0
13JL	SLH	0	0	0	0	0	0	0	0
13JL	FRL	33R	31R	47R	10R	30R	33R	51R	29R
13JL	FRH	40R	45R	61R	69R	30R	53R	11R	6R
13JL	FCL	0	28R	0	0	0	6R	0	0
13JL	FCH	0	2R	0	0	0	0	0	4L
13JL	FLL	0	0	0	0	0	1R	0	10R
13JL	FLH	0	41R	0	10R	0	6R	0	0
14JL	SRL	0	0	0	0	2R	0	4R	0
14JL	SRH	0	1R	5R	0	0	0	0	0
14JL	SCL	4R	0	9R	0	0	0	0	0
14JL	SCH	0	0	0	0	8R	0	0	0
14JL	SLL	0	0	0	6R	0	0	1R	1R
14JL	SLH	8R	11R	0	0	0	0	0	0
14JL	FRL	3R	2R	7R	17R	4R	5R	0	0
14JL	FRH	8R	33R	52R	20R	13R	16R	22R	9R
14JL	FCL	5R	0	0	0	0	0	0	17R
14JL	FCH	13R	35R	22R	0	0	17R	11R	0
14JL	FLL	1R	9R	0	0	6R	0	0	0
14JL	FLH	9R	10R	25R	0	0	9R	0	21R
15JL	SRL	0	0	0	0	0	0	0	13R
15JL	SRH	0	0	0	28R	0	0	0	0
15JL	SCL	0	18R	2R	10R	15R	7R	0	1R
15JL	SCH	2R	0	9R	30R	0	10R	0	11R
15JL	SLL	13R	0	15R	0	28R	19R	22R	11R
15JL	SLH	2R	4R	4R	7R	26R	6R	9R	0
15JL	FRL	40R	2R	30R	20R	7R	20R	19R	20R
15JL	FRH	12R	27R	24R	34R	38R	21R	43R	6R
15JL	FCL	0	1R	0	12R	0	0	6R	0
15JL	FCH	0	0	1R	0	6R	0	15R	0
15JL	FLL	9R	3R	0	2R	2R	6R	7R	7R
15JL	FLH	50R	0	16R	0	44R	8R	0	0
16JL	SRL	0	0	0	8R	0	1L	0	0
16JL	SRH	3R	2R	0	0	0	0	0	0
16JL	SCL	0	0	0	0	10R	21L	9L	0
16JL	SCH	0	3R	0	11R	0	8R	0	0
16JL	SLL	0	6R	0	0	0	10R	0	0
16JL	SLH	0	0	0	10R	7R	0	16R	0
16JL	FRL	5R	5R	0	6R	5R	1R	8R	4R
16JL	FRH	50R	30R	25R	32R	34R	1R	31R	31R
16JL	FCL	15R	0	0	0	0	7L	5R	0
16JL	FCH	16R	17R	0	6R	0	0	24L	10L
16JL	FLL	4R	0	0	0	0	0	0	0
16JL	FLH	0	14R	0	0	0	0	0	0

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
17JL	SRL	0	0	11R	0	0	0	0	0
17JL	SRH	24R	23R	21R	24R	23R	4R	13R	2R
17JL	SCL	0	0	0	0	0	0	0	0
17JL	SCH	0	0	0	0	0	0	0	0
17JL	SLL	0	0	0	0	9R	0	12R	0
17JL	SLH	0	3R	0	0	10R	0	0	0
17JL	FRL	30R	49R	25R	32R	26R	24R	36R	27R
17JL	FRH	40R	45R	45R	34R	46R	26R	18R	22R
17JL	FCL	10R	34R	0	0	26R	0	9R	3R
17JL	FCH	0	3R	0	1R	0	0	0	7R
17JL	FLL	0	0	12R	0	19R	0	0	0
17JL	FLH	12R	0	0	24R	13R	14R	30R	11R
18JL	SRL	8R	0	0	0	0	0	10R	23R
18JL	SRH	22R	16R	29R	16R	22R	16R	0	8R
18JL	SCL	16R	9R	0	3R	0	13R	0	0
18JL	SCH	18R	0	0	4R	0	8R	0	0
18JL	SLL	21R	10R	10R	16R	11R	0	0	12R
18JL	SLH	0	0	0	0	0	0	9R	2R
18JL	FRL	33R	30R	21R	27R	31R	43R	31R	20R
18JL	FRH	73R	35R	34R	37R	17R	34R	37R	45R
18JL	FCL	60R	10R	0	0	0	18R	0	6R
18JL	FCH	35R	19R	95R	5R	4R	3R	0	20R
18JL	FLL	13R	0	9R	8R	0	0	0	0
18JL	FLH	7R	0	1R	0	0	0	0	0
19HH	SRL	0	4R	0	9R	0	0	0	0
19HH	SRH	0	0	0	2R	0	0	0	0
19HH	SCL	5R	6R	0	1R	0	0	0	0
19HH	SCH	11R	11R	2R	0	0	0	0	0
19HH	SLL	21R	0	14R	0	0	1R	0	0
19HH	SLH	40R	0	10R	0	9R	0	8R	2R
19HH	FRL	27R	0	0	10R	3R	14R	9R	9R
19HH	FRH	22R	31R	7R	24R	35R	11R	20R	13R
19HH	FCL	0	0	14R	0	0	0	0	0
19HH	FCH	10R	3R	27R	0	0	21R	9R	0
19HH	FLL	11R	0	28R	0	0	0	7R	12R
19HH	FLH	0	0	17R	8R	0	0	0	5R
20HH	SRL	1R	0	0	0	0	0	0	0
20HH	SRH	0	0	0	0	0	0	0	0
20HH	SCL	2R	0	3R	0	0	11R	0	0
20HH	SCH	24R	0	18R	3L	0	0	0	0
20HH	SLL	38R	17R	3R	9R	4R	3R	0	10R
20HH	SLH	1R	11R	0	0	0	0	0	0
20HH	FRL	0	12R	0	2R	0	0	1R	0
20HH	FRH	23R	7R	44R	4R	5R	0	0	10R
20HH	FCL	0	21R	53R	12R	12R	0	0	15R
20HH	FCH	8R	3R	40R	0	0	6R	20R	5R
20HH	FLL	0	7R	15R	0	0	0	0	0
20HH	FLH	30R	0	0	0	0	0	11R	0

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	1	2	3	4	5	6	7	8
21HH	SRL	0	0	0	0	9L	0	0	0
21HH	SRH	0	0	0	0	0	0	0	0
21HH	SCL	9R	20R	25R	5R	0	0	18R	0
21HH	SCH	32R	27R	4R	0	1R	10R	0	0
21HH	SLL	27R	0	7R	14R	5R	10R	0	14R
21HH	SLH	7R	4R	23R	0	0	0	0	0
21HH	FRL	9R	3R	10R	0	0	0	0	0
21HH	FRH	8R	3R	22R	2R	0	0	21R	6R
21HH	FCL	12R	0	0	0	0	0	22R	0
21HH	FCH	1R	0	10R	14R	0	0	5R	20R
21HH	FLL	5L	0	0	0	16R	0	10R	0
21HH	FLH	0	0	0	0	6R	6R	0	0
22HH	SRL	0	0	0	2R	0	0	7R	0
22HH	SRH	16R	14R	10R	10R	0	0	0	0
22HH	SCL	0	0	0	20R	0	0	0	0
22HH	SCH	9R	0	0	0	0	0	0	0
22HH	SLL	15R	8R	4R	15R	0	0	0	8R
22HH	SLH	12R	0	0	0	0	0	3R	0
22HH	FRL	10R	3R	19R	8R	9R	0	29R	0
22HH	FRH	27R	23R	38R	31R	25R	16R	2R	13R
22HH	FCL	14R	31R	29R	5R	12R	5R	0	9R
22HH	FCH	34R	32R	0	0	4R	2R	1R	0
22HH	FLL	32R	17R	0	0	0	0	7R	0
22HH	FLH	10R	9R	34R	0	0	0	0	0
23HH	SRL	6R	0	0	7R	0	0	0	0
23HH	SRH	12R	20R	8R	15R	7R	3R	0	0
23HH	SCL	4R	1R	0	0	0	1R	0	0
23HH	SCH	0	0	0	8R	5R	0	0	0
23HH	SLL	9R	0	5R	0	0	2R	11R	11R
23HH	SLH	8R	14R	8R	0	9R	0	21R	1R
23HH	FRL	14R	24R	28R	35R	51R	21R	38R	11R
23HH	FRH	33R	42R	20R	30R	32R	0	5R	0
23HH	FCL	45R	0	20R	18R	40R	8R	12R	9R
23HH	FCH	33R	25R	23R	27R	5R	32R	18R	18R
23HH	FLL	0	10R	0	0	0	0	0	4R
23HH	FLH	0	0	0	0	0	0	18R	0
24HH	SRL	0	0	0	1R	2R	0	0	3R
24HH	SRH	10R	0	0	0	0	0	0	2R
24HH	SCL	0	0	0	8R	0	6R	0	0
24HH	SCH	12R	0	4R	0	0	0	0	0
24HH	SLL	35R	10R	0	21R	0	0	23R	0
24HH	SLH	20R	0	0	0	0	0	0	0
24HH	FRL	19R	0	7R	0	0	0	0	0
24HH	FRH	2R	12R	9R	0	16R	19R	26R	8R
24HH	FCL	6R	6R	27R	8R	3R	0	0	0
24HH	FCH	10R	8R	0	8R	30R	8R	0	0
24HH	FLL	31R	10R	18R	18R	3R	0	13R	0
24HH	FLH	30R	12R	10R	33R	0	10L	0	3L

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
25HH	SRL	0	0	0	0	7R	0	0	0
25HH	SRH	0	0	0	1R	5R	0	0	0
25HH	SCL	7R	13R	0	2R	8R	0	0	0
25HH	SCH	7R	0	14R	9R	0	0	0	0
25HH	SLL	0	11R	0	0	0	0	4R	0
25HH	SLH	0	0	0	1R	2R	0	4R	0
25HH	FRL	0	0	0	0	0	0	0	0
25HH	FRH	0	6R	5R	0	8R	5R	14R	0
25HH	FCL	4R	0	37R	0	0	0	0	0
25HH	FCH	0	0	0	4R	0	0	5R	0
25HH	FLL	0	0	0	0	3R	4R	1R	0
25HH	FLH	0	0	6R	0	0	0	0	1R
26HH	SRL	0	0	0	0	0	1R	0	0
26HH	SRH	0	0	3R	6R	0	0	4R	0
26HH	SCL	11R	3R	0	43R	2R	2R	0	9R
26HH	SCH	5R	4R	23R	0	0	0	12R	0
26HH	SLL	22R	0	12R	0	0	36R	8R	22R
26HH	SLH	0	0	0	0	0	21R	0	16R
26HH	FRL	0	12R	6R	6R	32R	30R	8R	6R
26HH	FRH	13R	32R	35R	29R	20R	32R	25R	26R
26HH	FCL	17R	4R	39R	0	1R	0	9R	0
26HH	FCH	31R	2R	15R	6R	0	15R	10R	14R
26HH	FLL	33R	0	12R	0	0	0	3R	6R
26HH	FLH	0	0	0	0	0	30R	0	0
27HH	SRL	10R	0	0	0	0	0	0	0
27HH	SRH	0	0	1R	0	0	0	0	0
27HH	SCL	0	2R	0	0	0	0	0	0
27HH	SCH	0	14R	0	0	0	0	0	16R
27HH	SLL	9R	0	0	0	0	0	0	0
27HH	SLH	18R	0	18R	0	0	0	0	0
27HH	FRL	0	23R	1R	0	0	0	0	0
27HH	FRH	0	11R	16R	21R	7R	2R	36R	13R
27HH	FCL	0	14R	1R	0	9R	6R	0	4R
27HH	FCH	4R	22R	0	0	4R	0	0	0
27HH	FLL	0	0	0	4R	0	0	0	0
27HH	FLH	0	12R	21R	0	0	0	0	0
28HL	SRL	12R	2R	0	3R	0	0	7R	0
28HL	SRH	1R	6R	17R	22R	0	0	0	0
28HL	SCL	5R	1R	10R	4R	0	10R	0	0
28HL	SCH	0	0	0	0	0	0	0	15R
28HL	SLL	0	16R	0	0	0	0	0	0
28HL	SLH	0	0	0	16L	0	0	0	0
28HL	FRL	60R	32R	15R	27R	18R	25R	19R	5R
28HL	FRH	36R	32R	37R	25R	27R	34R	40R	24R
28HL	FCL	20R	0	6R	4R	0	7R	0	15R
28HL	FCH	0	23R	0	0	0	4R	0	0
28HL	FLL	0	9R	0	3L	0	0	0	0
28HL	FLH	6L	0	7L	11L	10L	0	0	22L

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
29HL	SRL	5R	10R	0	0	0	0	0	0
29HL	SRH	18R	22R	8R	0	0	18R	0	0
29HL	SCL	2R	0	0	0	0	0	0	0
29HL	SCH	15R	0	0	0	0	0	0	0
29HL	SLL	7R	5R	0	0	0	0	0	0
29HL	SLH	15R	12R	2R	0	4R	0	0	0
29HL	FRL	18R	22R	25R	29R	19R	20R	22R	19R
29HL	FRH	28R	54R	20R	39R	25R	27R	21R	19R
29HL	FCL	3R	15R	0	4R	0	13R	0	0
29HL	FCH	0	0	0	0	0	0	0	0
29HL	FLL	0	0	0	0	5L	4L	1L	0
29HL	FLH	0	13R	14L	15L	0	20L	0	42L
30HL	SRL	15L	0	0	0	0	0	0	0
30HL	SRH	2R	2L	5R	4R	0	0	0	0
30HL	SCL	6R	2L	6R	23R	0	13R	0	0
30HL	SCH	0	0	0	0	0	0	4R	0
30HL	SLL	7R	16R	11R	0	19R	26R	0	11R
30HL	SLH	9R	23R	0	16R	26R	0	1R	0
30HL	FRL	1R	0	0	0	0	0	13R	0
30HL	FRH	14R	3R	11L	14R	8L	24R	18R	9R
30HL	FCL	0	0	38R	0	0	4L	0	0
30HL	FCH	2R	0	1R	23R	0	4R	5R	0
30HL	FLL	3R	0	14R	0	5R	9R	6R	6R
30HL	FLH	42R	10R	19L	0	0	5L	0	5L
31HL	SRL	0	0	0	0	0	0	0	0
31HL	SRH	5R	0	0	5R	0	0	4R	22R
31HL	SCL	0	0	22R	9R	0	0	0	0
31HL	SCH	16R	0	0	1R	0	0	0	0
31HL	SLL	0	12R	4R	0	0	0	0	0
31HL	SLH	0	0	0	0	0	0	0	0
31HL	FRL	7R	1R	19R	12R	19R	0	0	0
31HL	FRH	25R	57R	6R	2R	20R	27R	27R	51R
31HL	FCL	4R	5R	11R	5R	0	0	0	0
31HL	FCH	4R	3R	0	0	0	0	0	10R
31HL	FLL	0	0	0	0	0	0	0	0
31HL	FLH	0	0	11L	0	0	2R	0	0
32HL	SRL	0	0	0	0	0	0	0	0
32HL	SRH	0	5R	0	0	0	0	0	0
32HL	SCL	0	21R	5R	9R	0	0	4R	0
32HL	SCH	1R	14R	3R	0	0	0	21R	0
32HL	SLL	22R	8R	19R	16R	0	0	2R	0
32HL	SLH	0	8R	13R	27R	0	0	14R	3R
32HL	FRL	22R	30R	47R	21R	13R	23R	3R	9R
32HL	FRH	50R	64R	11R	31R	48R	30R	13R	0
32HL	FCL	53R	22R	24R	0	20R	11R	26R	0
32HL	FCH	25R	25R	49R	0	17R	0	16R	7R
32HL	FLL	0	0	0	2R	0	0	0	3R
32HL	FLH	0	3R	0	4R	0	0	0	0

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
33HL	SRL	16R	18R	9R	11R	0	12R	20R	0
33HL	SRH	2R	19R	0	0	0	0	0	0
33HL	SCL	1R	0	0	0	0	0	0	0
33HL	SCH	39R	0	10R	16R	0	32R	23L	7L
33HL	SLL	19R	27R	0	11R	8R	12R	9R	0
33HL	SLH	12R	0	25R	8R	12R	7R	0	0
33HL	FRL	19R	25R	17R	10R	11R	0	0	0
33HL	FRH	25R	24R	35R	10R	0	13R	2R	6R
33HL	FCL	26R	0	0	12R	50R	0	1R	0
33HL	FCH	14R	1R	45R	13R	0	0	0	22R
33HL	FLL	15R	17R	4R	5R	0	0	0	0
33HL	FLH	0	38R	0	0	0	0	0	0
34HL	SRL	29R	0	6R	0	0	0	8R	7R
34HL	SRH	26R	16R	0	4R	38R	9R	9R	6R
34HL	SCL	0	0	0	0	0	0	0	21R
34HL	SCH	0	20L	12R	8R	18L	9R	0	8R
34HL	SLL	0	0	0	0	0	0	0	0
34HL	SLH	0	0	0	0	10R	0	0	4R
34HL	FRL	18R	22R	7R	30R	17R	30R	18R	17R
34HL	FRH	26R	18R	16R	19R	32R	33R	42R	70R
34HL	FCL	29R	20R	17R	23R	14L	0	15R	0
34HL	FCH	1R	15R	9L	13R	24R	40R	8R	13L
34HL	FLL	9L	0	0	6L	1L	6L	24L	3L
34HL	FLH	11L	17L	0	0	16L	5L	0	80L
35HL	SRL	0	0	0	0	0	0	0	0
35HL	SRH	0	22R	3R	0	0	0	0	2R
35HL	SCL	0	19R	11R	0	0	0	0	0
35HL	SCH	0	6R	1L	0	0	3R	0	14L
35HL	SLL	0	4R	17R	0	0	3R	4R	0
35HL	SLH	9R	0	0	3R	0	9R	0	3R
35HL	FRL	20R	26R	25R	13R	22R	19R	21R	10R
35HL	FRH	74R	56R	24R	35R	31R	35R	6R	19R
35HL	FCL	26R	0	5R	2R	0	0	6R	0
35HL	FCH	2R	0	0	3L	0	0	0	0
35HL	FLL	0	4L	0	0	0	0	0	0
35HL	FLH	7L	7L	16L	2R	0	0	23L	0
36HL	SRL	0	0	6R	2R	0	0	0	0
36HL	SRH	15R	3R	3R	3R	0	0	3R	0
36HL	SCL	1R	7R	2R	5R	0	0	0	0
36HL	SCH	15R	78R	0	28R	0	0	0	0
36HL	SLL	4R	1R	0	22R	0	3R	0	0
36HL	SLH	0	0	0	0	0	2R	0	0
36HL	FRL	14R	18R	8R	10R	12R	5R	0	1R
36HL	FRH	21R	23R	37R	30R	9R	23R	17R	27R
36HL	FCL	24R	12R	4R	37R	0	0	21R	0
36HL	FCH	0	35R	0	2L	0	0	0	0
36HL	DLL	0	0	0	2L	0	0	0	0
36HL	FLH	0	0	0	0	0	0	0	0

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
37CH	SRL	0	0	0	0	0	0	0	0
37CH	SRH	0	0	0	0	0	0	0	0
37CH	SCL	0	0	0	0	14R	0	8R	0
37CH	SCH	0	0	0	0	4R	0	0	0
37CH	SLL	10R	14R	13R	5R	0	9R	0	8R
37CH	SLH	0	0	4R	0	0	0	0	0
37CH	FRL	3R	0	12R	8R	0	10R	24R	14R
37CH	FRH	18R	12R	6R	10R	1R	12R	17R	12R
37CH	FCL	13R	7R	21R	10R	10R	13R	7R	25R
37CH	FCH	0	10R	0	9R	12R	7R	12R	19R
37CH	FLL	6R	0	0	0	0	2R	11R	0
37CH	FLH	0	0	0	23R	2R	0	5R	16R
38CH	SRL	0	0	0	0	0	0	0	0
38CH	SRH	1R	0	0	0	0	0	0	0
38CH	SCL	4R	2R	0	1R	0	0	0	0
38CH	SCH	3R	0	0	0	0	0	1R	0
38CH	SLL	25R	30R	7R	15R	8R	8R	5R	6R
38CH	SLH	11R	17R	22R	25R	26R	13R	17R	25R
38CH	FRL	7R	16R	0	0	0	4R	0	0
38CH	FRH	0	1R	24R	18R	30R	10R	0	33R
38CH	FCL	33R	20R	0	8R	9R	15R	3R	0
38CH	FCH	7R	6R	12R	0	0	5R	5R	0
38CH	FLL	12R	17R	22R	12R	0	8R	4R	8R
38CH	FLH	10R	21R	21R	16R	5R	10R	10R	15R
39CH	SRL	0	0	4R	5R	2R	0	0	0
39CH	SRH	0	0	0	0	0	0	0	0
39CH	SCL	0	0	0	0	4R	13R	0	0
39CH	SCH	0	10R	0	0	9R	14R	0	0
39CH	SLL	0	0	0	0	0	0	0	0
39CH	SLH	0	0	0	6R	0	0	0	0
39CH	FRL	0	0	0	0	0	3R	0	0
39CH	FRH	12R	31R	26R	0	23R	27R	18R	7R
39CH	FCL	6R	0	0	9R	5R	4R	0	4R
39CH	FCH	4R	3R	4R	3R	3R	3R	3R	3R
39CH	FLL	0	0	18R	17R	20R	0	16R	21R
39CH	FLH	0	0	0	8R	0	0	0	0
40CH	SRL	0	0	0	0	0	0	0	0
40CH	SRH	0	0	0	0	0	0	0	0
40CH	SCL	0	12R	15R	14R	14R	16R	12R	0
40CH	SCH	0	8R	0	0	0	0	0	0
40CH	SLL	0	30R	23R	5R	16R	17R	12R	8R
40CH	SLH	5R	2R	7R	13R	20R	37R	15R	0
40CH	FRL	20R	0	0	0	0	22R	10R	0
40CH	FRH	10R	3R	16R	22R	17R	5R	2R	0
40CH	FCL	15R	27R	15R	42R	21R	5R	0	5R
40CH	FCH	4R	5R	6R	0	6R	8R	0	1R
40CH	FLL	18R	27R	11R	12R	22R	35R	26R	34R
40CH	FLH	2R	10R	0	0	0	0	6R	14R

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
41CH	SRL	0	0	0	0	0	0	0	0
41CH	SRH	11R	0	0	0	6R	0	0	2R
41CH	SCL	0	0	0	0	0	0	0	0
41CH	SCH	8R	6R	0	2R	0	0	0	0
41CH	SLL	4R	0	0	0	0	0	0	15R
41CH	SLH	0	0	0	0	5R	1R	0	0
41CH	FRL	33R	0	1R	8R	5R	0	0	0
41CH	FRH	4R	15R	2R	1R	3R	2R	3R	10R
41CH	FCL	15R	1R	0	3R	2R	5R	18R	1R
41CH	FCH	15R	0	0	0	0	10R	39R	0
41CH	FLL	11R	3R	4R	8R	5R	4R	8R	13R
41CH	FLH	17R	1R	0	0	3R	3R	0	0
42CH	SRL	0	0	0	0	0	0	0	0
42CH	SRH	16R	0	0	0	0	0	0	0
42CH	SCL	6R	0	4R	1R	0	2R	0	0
42CH	SCH	0	0	0	0	0	0	0	0
42CH	SLL	9R	10R	5R	0	0	8R	0	10R
42CH	SLH	0	0	0	1R	0	0	1R	0
42CH	FRL	0	7R	15R	10R	16R	3R	4R	9R
42CH	FRH	7R	5R	11R	6R	8R	13R	15R	8R
42CH	FCL	22R	6R	0	4R	8R	7R	8R	0
42CH	FCH	1R	0	0	0	4R	0	0	0
42CH	FLL	0	5R	4R	0	9R	6R	0	5R
42CH	FLH	0	0	0	0	7R	0	0	0
43CH	SRL	0	0	0	0	0	0	0	13R
43CH	SRH	0	0	0	0	1R	0	0	16R
43CH	SCL	1R	0	0	0	0	0	0	0
43CH	SCH	0	0	0	0	0	2R	0	13R
43CH	SLL	0	0	6R	0	0	0	0	0
43CH	SLH	0	0	0	0	0	0	0	0
43CH	FRL	3R	5R	15R	20R	0	21R	6R	7R
43CH	FRH	50R	16R	22R	29R	28R	37R	18R	21R
43CH	FCL	30R	10R	0	4R	11R	5R	26R	40R
43CH	FCH	61R	40R	56R	25R	39R	31R	37R	50R
43CH	FLL	15R	8R	16R	23R	0	4R	5R	12R
43CH	FLH	0	0	0	0	0	0	0	28R
44CH	SRL	0	0	0	0	0	0	9R	0
44CH	SRH	3R	2R	1R	1R	2R	0	0	0
44CH	SCL	5R	7R	0	0	0	0	3L	2R
44CH	SCH	0	0	0	0	0	0	6R	0
44CH	SLL	0	0	6R	0	16R	0	0	0
44CH	SLH	0	7R	0	0	0	0	0	12R
44CH	FRL	10R	19R	9R	2R	0	3R	37R	0
44CH	FRH	27R	41R	12R	15R	22R	23R	30R	32R
44CH	FCL	6R	4R	2R	0	4R	0	5R	0
44CH	FCH	25R	22R	22R	31R	42R	0	0	30R
44CH	FLL	18R	12R	38R	51R	28R	13R	17R	44R
44CH	FLH	32R	56R	5R	20R	23R	16R	37R	15R

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
45CH	SRL	0	9R	0	0	0	0	0	0
45CH	SRH	0	0	14R	4R	2R	4R	6R	0
45CH	SCL	10R	0	0	6R	0	0	0	0
45CH	SCH	10R	0	0	0	0	0	0	0
45CH	SLL	4R	0	0	7R	3R	0	9R	18R
45CH	SLH	0	0	2R	0	1R	0	20R	0
45CH	FRL	8R	17R	6R	0	6R	5R	2R	4R
45CH	FRH	6R	6R	3R	4R	7R	6R	6R	8R
45CH	FCL	13R	18R	3R	7R	8R	4R	3R	3R
45CH	FCH	5R	3R	12R	1R	8R	3R	3R	2R
45CH	FLL	0	2R	9R	0	10R	9R	2R	2R
45CH	FLH	2R	2R	10R	0	1R	0	2R	2R
46CH	SRL	0	0	0	0	0	0	0	10L
46CL	SRH	0	0	0	0	0	0	0	0
46CL	SCL	4R	0	7R	2R	0	1R	0	0
46CL	SCH	0	0	0	0	0	0	0	0
46CL	SLL	6R	27R	9R	10R	4R	16R	8R	0
46CL	SLH	0	11R	0	0	1R	3R	14R	29R
46CL	FRL	1R	2R	0	2R	2R	1R	8R	0
46CL	FRH	22R	24R	12R	0	7R	0	0	0
46CL	FCL	31R	0	32R	11R	16R	0	0	19R
46CL	FCH	20R	19R	33R	20R	6R	4R	0	49R
46CL	FLL	0	0	0	8R	0	19R	21R	19R
46CL	FLH	0	0	21R	14R	13R	18R	13R	19R
47CL	SRL	1R	0	0	0	0	0	0	0
47CL	SRH	0	0	0	0	0	6R	0	0
47CL	SCL	6R	0	0	3R	4R	2R	4R	2R
47CL	SCH	0	8R	0	0	0	0	0	11R
47CL	SLL	10R	1R	5R	3R	3R	27R	11R	20R
47CL	SLH	12R	0	0	10R	15R	26R	0	0
47CL	FRL	15R	15R	0	0	0	0	0	0
47CL	FRH	23R	42R	8R	0	0	0	0	47R
47CL	FCL	0	0	28R	17R	22R	27R	20R	0
47CL	FCH	1R	0	49R	5R	6R	9R	5R	7R
47CL	FLL	0	0	0	0	0	12R	0	21R
47CL	FLH	0	0	0	0	1R	0	0	0
48CL	SRL	0	0	0	0	0	0	0	0
48CL	SRH	0	0	1R	0	3R	0	0	0
48CL	SCL	0	0	2R	0	4R	0	0	0
48CL	SCH	0	0	6R	0	4R	0	8R	1R
48CL	SLL	0	0	10R	0	14R	6R	8R	5R
48CL	SLH	0	11R	7R	31R	8R	7R	11R	9R
48CL	FRL	15R	12R	20R	31R	26R	13R	0	0
48CL	FRH	11R	20R	18R	3R	0	0	16R	0
48CL	FCL	0	17R	10R	3R	4R	7R	20R	8R
48CL	FCH	0	36R	20R	18R	19R	30R	25R	14R
48CL	FLL	0	13R	22R	28R	12R	16R	24R	0
48CL	FLH	0	0	5R	0	11R	0	7R	0

DEVIATION SCORES--LATERAL

SUB-JECT ID	CONDI-TION	TRIALS 1	2	3	4	5	6	7	8
49CL	SRL	0	0	9R	7R	0	9R	6R	3R
49CL	SRH	0	0	0	7R	0	5R	2R	0
49CL	SCL	0	0	15R	0	0	0	0	0
49CL	SCH	5R	5R	0	0	0	13R	7R	0
49CL	SLL	12R	14R	4R	17R	16R	5R	12R	10R
49CL	SLH	0	0	9R	0	13R	0	0	0
49CL	FRL	10R	0	0	0	0	0	0	0
49CL	FRH	43R	13R	0	0	0	0	0	0
49CL	FCL	19R	0	50R	0	0	4R	2R	0
49CL	FCH	0	0	47R	0	36R	23R	16R	20R
49CL	FLL	0	16R	24R	21R	24R	17R	19R	21R
49CL	FLH	17R	4R	9R	12R	20R	2R	11R	13R
50CL	SRL	0	1R	9R	0	0	12R	6R	0
50CL	SRH	0	0	0	0	0	0	0	0
50CL	SCL	4R	0	2R	0	2R	0	0	0
50CL	SCH	2R	9R	12R	0	8R	0	7R	1R
50CL	SLL	0	0	2R	0	0	0	10R	11R
50CL	SLH	0	19R	0	0	0	0	0	0
50CL	FRL	3R	8R	8R	10R	9R	33R	0	0
50CL	FRH	20R	5R	22R	28R	12R	0	0	0
50CL	FCL	26R	13R	0	2R	46R	23R	0	0
50CL	FCH	1R	42R	0	12R	0	0	13R	17R
50CL	FLL	0	0	21R	7R	37R	16R	20R	28R
50CL	FLH	16R	11R	23R	15R	0	16R	13R	0
51CL	SRL	0	0	3R	0	0	0	0	0
51CL	SRH	0	0	0	0	0	0	0	0
51CL	SCL	0	0	0	0	0	0	0	0
51CL	SCH	6R	7R	0	4R	27R	0	8R	4R
51CL	SLL	9R	37R	12R	41R	27R	24R	16R	21R
51CL	SLH	33R	6R	21R	41R	37R	14R	17R	32R
51CL	FRL	24R	28R	0	0	0	0	15R	0
51CL	FRH	22R	19R	0	27R	23R	37R	33R	28R
51CL	FCL	4R	69R	15R	0	0	4R	0	10R
51CL	FCH	26R	0	0	16R	0	0	13R	11R
51CL	FLL	0	4R	22R	18R	8R	15R	11R	11R
51CL	FLH	0	0	24R	12R	2R	15R	7R	13R
52CL	SRL	0	2R	0	0	0	0	0	0
52CL	SRH	0	0	0	0	0	0	0	0
52CL	SCL	17R	18R	0	3R	0	0	0	0
52CL	SCH	14R	0	9R	0	0	5R	2R	0
52CL	SLL	15R	14R	11R	17R	10R	9R	13R	6R
52CL	SLH	24R	1R	0	0	11R	7R	10R	0
52CL	FRL	19R	19R	28R	0	0	1R	6R	0
52CL	FRH	28R	17R	6R	8R	0	0	0	9R
52CL	FCL	44R	33R	28R	0	31R	28R	34R	26R
52CL	FCH	32R	40R	16R	25R	0	51R	43R	29R
52CL	FLL	0	0	0	1R	0	0	0	0
52CL	FLH	0	0	0	0	0	0	0	0

DEVIATION SCORES--LATERAL

SUBJECT ID	CONDITION	TRIALS 1	2	3	4	5	6	7	8
53CL	SRL	0	0	0	0	0	0	0	0
53CL	SRH	3R	15R	2R	0	0	0	0	0
53CL	SCL	1R	0	0	0	0	0	0	0
53CL	SCH	3R	38R	10R	4R	0	0	0	15R
53CL	SLL	0	0	6R	18R	0	3R	0	10R
53CL	SLH	0	19R	13R	7R	11R	7R	0	3R
53CL	FRL	19R	5R	9R	10R	12R	14R	13R	0
53CL	FRH	34R	27R	20R	16R	0	18R	12R	4R
53CL	FCL	0	28R	16R	9R	14R	12R	18R	10R
53CL	FCH	16R	8R	5R	3R	0	2R	0	30R
53CL	FLL	0	2L	0	1R	0	7R	10R	12R
53CL	FLH	9R	0	0	6R	0	0	1R	0
54CL	SRL	0	0	0	0	0	0	11R	9R
54CL	SRH	0	0	0	1R	0	0	0	0
54CL	SCL	0	0	0	0	0	0	0	0
54CL	SCH	0	0	0	0	0	0	0	0
54CL	SLL	10R	14R	9R	6R	21R	13R	0	18R
54CL	SLH	19R	15R	18R	0	9R	21R	32R	0
54CL	FRL	10R	0	0	45R	0	16R	0	0
54CL	FRH	26R	0	19R	5R	34R	27R	0	0
54CL	FCL	33R	16R	11R	4R	2R	1R	3R	0
54CL	FCH	28R	34R	20R	8R	0	0	0	0
54CL	FLL	0	0	0	0	20R	9R	5R	6R
54CL	FLH	0	0	0	1R	28R	17R	5R	23R

RESULTS OF SCHEFFE'S MULTIPLE COMPARISON TESTS

DISTANCE DEVIATION

CONDITION	MEANS COMPARED	d	d^2	A-VALUE	SIG. A-VALUE
HD	Lt Vs Ctr	1,775.52	3,152,471.27	29,189.55*	13,920.26
	Lt Vs Rt	108.00	11,664.00	108.00	
	Ctr Vs Rt	1,879.20	3,531,392.64	32,698.08*	
Sp X HD	SR Vs FR	1,576.80	2,486,298.24	23,021.28	45,488.098
	SL Vs FL	2,764.80	7,644,119.04	70,778.88*	
	SC Vs FC	1,205.28	1,452,699.88	13,450.92	
Sp X VD	SH Vs SL	10,445.76	109,113,901.98	1,010,313.39*	74,531.25
	FH Vs FL	5,425.92	29,440,607.85	272,598.22*	
	SH Vs FL	2,505.60	6,278,031.36	58,129.92	
	SL Vs FH	2,514.24	6,321,402.78	58,531.51	
VD X HD	LR Vs LC	423.36	179,233.69	1,659.57	31,249.99
	LR Vs LL	555.20	2,418,647.04	22,394.88	
	LC Vs LL	1,131.84	1,281,061.79	11,861.68	
	HR Vs HC	3,330.72	11,093,695.72	102,719.40*	
	HR Vs HL	1,334.88	1,781,904.61	16,499.12	
	HC Vs HL	4,665.60	21,767,823.36	201,553.92*	
Age X Sp X VD	JFL Vs HFL	523.38	273,926.62	7,609.07	193,083.28
	JFL Vs CFH	306.02	93,648.24	2,601.34	
	HFL Vs CFH	217.36	47,245.37	1,312.37	
	JFH Vs HFH	491.92	241,985.29	6,721.81	
	JFH Vs CFH	1,615.90	2,611,132.81	72,531.46	
	HFH Vs CFH	1,123.98	1,263,331.04	35,092.53	
	JSH Vs HSH	1,688.83	2,852,146.77	79,226.30	
	JSH Vs CSH	644.93	415,934.70	11,553.74	
	HSH Vs CSH	1,043.90	1,089,727.21	30,270.20	
	JSL Vs HSL	1,837.55	3,376,590.00	93,794.17	
	JSL Vs CSL	793.83	948,344.87	26,342.91	
	HSL Vs CSL	2,811.38	7,903,857.50	219,551.597*	

DISTANCE DEVIATION (CONT'D)

CONDITION	MEANS COMPARED	d	d^2	A-VALUE	SIG. A-VALUE
Sk X Sp X VD	HFH Vs HFL	876.96	769,058.84	14,241.83	173,906.26
	LFH Vs LFL	9,966.25	99,326,139.06	1,839,372.95*	
	HSH Vs HSL	7,607.52	57,874,360.55	1,071,747.42*	
	LSH Vs	13,284.00	176,464,656.00	3,267,864.00*	

LATERAL DEVIATION

CONDITION	MEANS COMPARED	d	d^2	A-VALUE	Sig. A-VALUE
HD	Lt Vs Rt	1,680.48	2,824,013.03	26,148.27*	4,136.1384
	Lt Vs Ctr	1,425.60	2,032,335.36	18,817.92*	
	Ctr Vs Rt	254.88	64,963.81	601.52	
Age X HD	JR Vs HR	103.68	10,749.54	298.60	9,233.37
	JR Vs CR	1,438.56	2,069,454.87	57,484.86*	
	HR Vs CR	1,334.88	1,781,904.61	49,497.35*	
	JC Vs HC	324.00	104,976.00	2,916.00	
	JC Vs CC	725.76	526,727.58	14,631.32*	
	HC Vs CC	410.40	168,428.16	4,678.56	
	JL Vs HL	1,948.32	3,795,950.82	105,443.08*	
	JL Vs CL	3,607.20	13,011,891.84	361,441.44*	
	HL Vs CL	1,658.88	2,751,882.85	76,441.19*	
Sp X HD	FR Vs FC	1,529.28	2,338,697.32	21,654.60*	4,555.36
	FR Vs FL	4,579.20	20,969,072.64	194,158.08*	
	FC Vs FL	3,049.92	9,302,012.01	86,129.74*	
	SR Vs SC	1,019.52	1,039,421.03	9,624.27*	
	SR Vs SL	1,218.24	1,484,108.70	13,741.75*	
	SC Vs SL	198.72	39,489.64	365.64	
	FR Vs SR	60.48	3,657.83	33.87	
Sp X VD	FH Vs FL	1,288.98	1,661,469.44	15,383.98*	1,338.67
	SH Vs SL	64.80	4,199.04	38.88	
VD X HD	HR Vs HC	51.84	2,687.39	24.88	1,961.92
	HR Vs HL	272.16	74,071.07	685.84	
	HC Vs HL	324.00	104,976.00	972.00	
	LR Vs LC	565.92	320,265.45	2,965.42*	
	LR Vs LL	3,088.80	9,540,685.44	88,339.68*	
	LC Vs LL	2,522.88	6,364,923.49	58,934.48*	

RADIAL ERROR

CONDITION	MEANS COMPARED	d	d^2	A-VALUE	SIG. A-VALUE
HD	Lt Vs Ctr	2,436.48	5,936,434.79	54,966.99*	16,983.37
	Lt Vs Rt	846.72	716,934.76	6,638.28	
	Ctr Vs Rt	1,589.76	2,527,336.86	23,401.28*	
Sp X HD	SR Vs FR	1,150.20	1,322,960.04	12,249.63	45,188.96
	SL Vs FL	4,409.64	19,444,924.93	180,045.60*	
	SC Vs FC	217.08	47,123.73	436.33	
Sp X VD	SH Vs SL	7,315.96	53,522,685.45	495,580.42*	50,756.09
	FH Vs FL	3,171.96	10,061,330.24	93,160.47*	
	SH Vs FH	6,402.24	40,988,677.02	379,524.79*	
	SL Vs FL	4,085.64	16,692,454.21	154,559.76*	
HD X VD	LR Vs LC	392.04	153,695.36	1,423.11	74,522.19
	LR Vs LL	511.92	262,062.09	2,426.50	
	LC Vs LL	119.88	14,371.21	133.07	
	HR Vs HC	4,354.56	18,962,192.79	175,575.86*	
	HR Vs HL	1,015.20	1,030,631.04	9,542.88	
	HC Vs HL	3,339.36	11,151,325.21	103,253.01*	
Sk X Sp X VD	HSH Vs HSL	3,501.36	12,259,521.85	227,028.18*	201,781.53
	LSH Vs LSL	6,253.20	39,102,510.24	724,120.56*	
	HFH Vs HFL	123.12	15,158.53	280.71	
	LFH Vs LFL	4,104.00	16,842,816.00	311,904.00*	

REACTION TIME

CONDITION	MEANS COMPARED	d	d^2	A-VALUE	SIG. A-Value
HD	Lt Vs Ctr	22.032	485.41	4.49*	3.2289
	Lt Vs Rt	55.196	3,046.60	28.21*	
	Ctr Vs Rt	33.264	1,106.49	10.25*	

MOVEMENT TIME

CONDITION	MEANS COMPARED	d	d^2	A-VALUE	SIG. A-VALUE
HD	Lt Vs Ctr	3.024	9.14	.085	3.039
	Lt Vs Rt	57.456	3,301.19	30.57*	
	Ctr Vs Rt	54.432	2,962.84	27.43*	